TM 11-6625-274-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

14 JUNE 1960

WARNING

Be careful not to contact high-voltage connections or the 115-volt ac input connections when replacing tubes in the test set. Voltages up to 300 volts ac may be encountered in this equipment. Serious injury or death may result from contact with these connections.

DON'T TAKE CHANCES!

TECHNICAL MANUAL

Operator's and Organizational Maintenance Manual,

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B-U AND TV/7D/U

TM 11-6625-274-12
CHANGES No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *30 January 1963*

TM 11-6625-274-12, 14 June 1960, is changed as follows:

Page 7. Add paragraph 1.1 after paragraph 1:

1.1. Index of Publications

Refer to the latest issue of DA Pamphlet 310-4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. Department of the Army Pamphlet No. 310-4 is a current index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders that are available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Unsatisfactory Equipment. Fill out DA Form 2407 (Maintenance Request) in accordance with instructions in TM 38-750 and forward it to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-PIE, Fort Monmouth, N. J. The form should be filled out and forwarded to report:

(1) Receipt of defective equipment (use DA Form 6 (*b* below) if defect is due to damaged or improper shipment).

(2) Equipment deficiencies (deadlined equipment).

(3) Equipment shortcomings (operable, but at less than rated capability or efficiency).

(4) Equipment improvement suggestions and recommendations.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58 (Army), NAVSANDA Publication 378, and AFR 71-4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Forth Monmouth, N.J. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 22. Make the following changes:

Chapter 3, heading. After the heading, add:

Section I. OPERATOR'S MAINTENANCE

Delete paragraph 31, 32, and 33 and figures 11 and 12, and substitute:

31. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U are listed below together with a reference to the paragraph covering the specific maintenance function. The duties assigned do not require tools or test equipment other than those issued with the equipment.

a. Daily maintenance service and inspection (par. 33).

b. Cleaning (par. 33.1).

c. Visual inspection (par. 34).

d. Tube replacement (par. 37).

e. Replacement of lamps (par. 39).

32. Operator's Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of the equipment to prevent the occurrence of trouble, to reduce *downtime*, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraph 33 cover systematic care essential to proper upkeep of the equipment when it is used daily. If the equipment is not used daily, however, the cleaning operations must be performed before operation, after any extended shutdown, or once a week while the equipment is kept in *standby* condition. The other items must be checked before the equipment is placed in operation after a shutdown, or after it is turned off, as specified in the applicable paragraph.

b. Maintenance Service and Inspection. The maintenance service and inspection chart (par. 33) outlines inspections to be made at specific intervals. These inspections are made to determine combat serviceability; that is, to determine that the equipment is in good general (physical) condition, in good operating condition, and likely to remain combat serviceable. To assist operators in determining and maintaining combat serviceability, the chart indicates what to inspect, how to inspect, and what the normal conditions are; the *References* column list the paragraph that contains additional information. If the defect cannot be remedied by the operator, higher echelon maintenance repair is required. Records and reports of these inspections must be made in accordance with TM 38–750.

33. Daily Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	INITIAL CHECK: Inspect the equipment for completeness and cleanliness.	Equipment must be complete, clean and dry, and free of grease, dirt, rust, corrosion, and fungus.	App. II and par. 33.1.
6	AC LINE CORD: Inspect ac line cord for kinks, fraying, cracked insulation and breaks.	Ac line cord must be in good condition. Tape frayed or cracked areas.	None.
8	PERFORMANCE: Perform the starting procedures given in paragraph 17.	As stated in paragraph 17----------	Par. 17.

33.1. Cleaning

Inspect the exterior of the test set. The exterior surfaces should be clean, free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

Warning: **Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation.** ***Do not*** **use near a flame.**

b. Remove grease, fungus, and ground-in dirt from the case; use a cloth dampened (not wet) with cleaning compound.

c. Remove dust or dirt from plugs and jacks with a brush.

Caution: **Do not press on the meter face (glass) when cleaning; the meter may be damaged.**

d. Clean the front panel, meter, and control knobs; use a soft clean cloth. If difficulty in removing dirt occurs, dampen the cloth with water; mild soap may be used to make the cleaning more effective.

Section II. ORGANIZATIONAL MAINTENANCE

33.2. Monthly Maintenance

Monthly maintenance on Test Set, Electron Tube TV–7(*)/U will be scheduled in accordance with the requirements of TM 38–750. If the equipment is part of a vehicular installation, the monthly maintenance should be scheduled concurrently with the periodic service schedule of the carrying vehicle to reduce out-of-service time to a minimum. All deficiencies or shortcomings will be recorded, and those not corrected during the inspection and service will be immediately reported to higher echelon by

use of forms and procedures specified by TM-38–750. Equipment with a deficiency that cannot be corrected by second echelon should be deadlined in accordance with TM 38–750. Perform all the services listed in the monthly maintenance and inspection chart (par. 33.3) in the sequence listed. Whenever a *normal condition or result* is not observed, take corrective action in accordance with the paragraph listed under the *Reference* column.

33.3 Monthly Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	INITIAL CHECK: Inspect the equipment for:		
	a. Completeness	*a.* Equipment must be complete.	*a.* App. II.
	b. Cleanliness	b. Unit must be clean and dry inside and out; free of grease, dirt, rust, corrosion, and fungus.	*b.* Par. 33.1.
2	PUBLICATIONS: Check to see that pertinent publications are available.	*a.* Manual must be complete and in usable condition without missing pages.	*a.* Par. 1.1
		b. All changes pertinent to the equipment are on hand.	*b.* DA Pam 310–4 for requirements.
3	MODIFICATION WORK ORDERS: Check DA Pam 310–4 to determine if new applicable MWO's have been published.	ALL URGENT MWO's have been applied to the equipment. All ROUTINE MWO's have been scheduled.	DA Pam 310–4.
4	PLUCKOUT ITEMS: Inspect the seating of fuse and tubes.	All items should be properly seated	None.
5	EXTERNAL HARDWARE: Inspect exterior hardware for looseness or binding.	*a.* All knobs must be present and firmly secured to their respective shafts.	*a.* None.
		b. All control and switch shafts must not bind.	*b.* Higher echelon maintenance required.
		c. The carrying handle and other hardware must be tight.	*c.* Higher echelon maintenance required.
6	AC LINE CORD: Inspect ac line cord for kinks, fraying, cracked insulation, and breaks.	Ac line cord must be in good condition. Tape frayed or cracked areas.	None.
7	INTERIOR: Inspect interior components and hardware for cleanliness and general physical condition.	*a.* Interior components and hardware must be free of dust, dirt, corrosion, fungus, and moisture.	*a.* None.
		b. Resistors, capacitors, and insulators must be free of cracks, blistering, burns, and discoloration.	*b.* None.
8	PERFORMANCE: Perform the procedures in the equipment performance checklist (par. 35).	As stated in paragraph 35	Par. 35.
9	SPARE PARTS: Check all spare parts (operator and organizational) for general condition and method of storage.	All spare parts must be in good condition and properly stored. There should be no evidence of overstock, and all shortages will be on valid requisitions.	App. II.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DASA (5)
USASA (2)
CNGB (1)
CofEngrs (1)
TSG (1)
CSigO (5)
CofT (1)
USA CD Agcy (1)
USAATBD (1)
USCONARC (5)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (3)
OS Base Comd (2)
LOGCOMD (2)
MDW (1)
Armies (2)
Corps (2)
Div (2)
1st GM Bde (5)
1st FA Msl Bde (5)
AMC (5)
USA Elct Mat Comd (5)
Instal (2) except
Ft Monmouth (63)
AAF (CONUS) (2)
USA Tng Cen (2)
USMA (5)
USA Msl Comd (4)
USA Wpns Comd (5)
Br Svc Sch (2) except
USASCS (100)
USA Cml Cen (5)
USA Trans Rsch Comd (5)
USA Trans Tml Comd (5)
Gen Dep (OS) (2)
Sig Sec, Gen Dep (5)
Sig Dep (OS) (12)
Army Dep (5) except
Lexington, Tobyhanna (12)
Sacramento (17) Rossford (10)
BAMC (5)
WRAMC (5)
Gen Hosp (5)
USA Cml R&D Lab (5)
USAMOAMA (5)
USAINTC (5)
Engr Cen (5)
JCA (5)
APG (5)
USAPRDC (5)
USA Ammo Proc & Sup Agcy (5)
Def Gen Sup Cen (5)
White House Army Sig Agcy (5)
USA SPWAR Cen (5)
Army Tml (1)
POE (1)
OSA (1)
USA Elct R&D Activity,
Ft Huachuca (2)
USA Elct R&D Activity (WSMR) (13)
AFIP (1)
AMS (1)
USA Pictorial Cen (2)
USA Mobility Spt Cen (1)
USA Strat Comm Comd (4)
USA Elct Mat Agcy (25)
Chicago Proc Dist (1)
USA CARIB SIG Agcy (1)
USA Sig Fld Maint Shops (3)
USA Corps (3)
Def Log Svc Cen (1)
JBUSMC (2)
Units org under fol TOE:
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5–148
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5–227
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5–348
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5–500 AA–AD
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8–137
8–500 AA–AH
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9–65
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9–86
9–87
9–217
9–227
9–377
9–500 AA–AC
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19–500 AA–AE
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33–106
33–107
33–500 AC
33–600 AA–AX
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45–500 AA–AC
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55–128
55–129
55–137
55–138
55–157
55–500 AA–AE
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57–42

NG: State AG (3) units same as active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

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*TM 11-6625-274-12
C 4

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *22 June 1966*

Operator's And Organizational Maintenance Manual

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, And TV-7D/U

TM 11-6625-274-12, 14 June 1960, is changed as follows:

Note. The parenthetical reference to previous changes (example: "page 1 of C 2") indicates that pertinent material was published in that change.

Page 7, paragraph 1.1 (as changed by C 3, 18 May 64) line 6 after "Technical Bulletins," add Supply Manuals (Types 4, 6, 7, 8, and 9.)

Paragraph 2 (page 1 of C 2, 30 Jan. 63). Delete and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipments. Fill out and forward DA Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army) NAVSANDA Publications 378 (Navy) and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Publications) will be used for reporting these improvements. This form will be completed using pencil, pen or typewriter and forwarded direct to Command, ATTN: AMSEL - MR - NMP - AD paragraph 18*c* (1), Note. Delete the note.

Page 17, (as changed by C 3, 18 May 64) paragraph 18*c* (1), Note. Delte the note.

Page 18, paragraph 21*d,* note.

Note (as changed by C 3, 18 May 64). If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob to full scale (100 on dial).

Page 33, appendix I, (as changed by C 3, 18 May 64).

Delete and substitute.

APPENDIX I

REFERENCES

The following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U.

DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, (types, 3, 6, 7, 8 and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.	SB-38-100	Preservation Packaging

*This change supersedes C 3, 18 May 1961.

	and Packing Materials, Supplies and Equipment Used by the Army.	
TM 38-750	Army Equipment Record Procedures.	
TM 11-6625-274 25P	Organizational, DS, GS, and Depot	Maintenance Repair Parts And Special Tool Lists, Test sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, And TV-7D/U.

Page 34, appendix II, delete and substitute:

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

Columns are as follows:

a. Federal Stock Number. This column lists the 11-digit Federal stock number.

b. Designation by Model. The dagger (†) indicates model in which the part is used.

c. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

d. Unit of issue. The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

e. Expendability. Nonexpendable items are indicated by NX. Expendable items are not annotated.

f. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spare Items" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

g. Illustration. The "Item No." column lists the reference designations that appear on the part in the equipment. These same designations are also used on any illustrations of the equipment. The numbers in the "Figure No." column refer to the illustrations where the part is shown.

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL						DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
											FIGURE NO.	ITEM NO.
							TEST SET, ELECTRON TUBE TV-7/U; TV-7A/U; TV-7B/U; and TV-7D/U NOTE: Model column 1 refers to TV-7/U; column 2 refers to TV-7A/U; column 3 refers to TV-7B/U; column 4 refers to TV-7D/U ITEMS COMPRISING AN OPERABLE EQUIPMENT					
6625-376-4939							TEST SET, ELECTRON TUBE TV-7/U, TV-7A,B/U: dynamic mutual conductance type; 0.6 to 117V fil voltage range meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125V, 50 to 1000 cycles single phase; SW positions A thru E; portable type		NX		1,2,3	
6625-820-0064							TEST SET, ELECTRON TUBE TV-7D/U: dynamic mutual conductance type; 0.6 to 117V fil voltage range; meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125V, 50 to 1000 cycles single phase; SW position A thru F, portable type		NX			
ORD THRU AGC	/	/	/	/			TECHNICAL MANUAL TM 11-6625-274-12			2		
5935-204-8379	/	/	/	/			ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-B-425536			1	8	E104
5935-537-4056	/	/	/	/			ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-C-179260			1	8	E105
5935-511-6491	/	/	/	/			ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-B-425538			1	8	E107
6625-684-1189	/	/	/	/			ADAPTER, TEST: ECOM dwg SM-B-425638			1	4	X3B
6625-618-9928	/	/	/	/			ADAPTER, TEST: ECOM dwg SM-B-425639			1	4	X7B
6625-618-9929	/	/	/	/			ADAPTER, TEST: ECOM dwg SM-B-425640			1	4	X10B
6625-727-7065	/	/	/	/			ADAPTER, ELECTRONIC TUBE SOCKET: nuvistor tube socket adapter; Hickock Inst Co. p/n 1050-127			1		
6625-069-1960	/	/	/	/			ADAPTER, TEST: socket for GE Micro-Miniature 7077 and 7486; Jettron Prod Inc p/n 86-060			1		
6625-668-4683	/	/	/				LEAD, TEST: ECOM dwg SM-B-425548			2	15	W101,W102
6625-727-7065				/			LEAD, TEST: ECOM dwg SM-B-45548			2	15	W101,W102

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL						DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
											FIGURE NO.	ITEM NO.
							TV-7/U; TV-7A,B,D/U (continued)					
							RUNNING SPARE ITEMS					
5960-262-0218	/	/	/	/			ELECTRON TUBE: MIL type 5Y3WGTA			1	15	V102
5960-100-7323	/	/	/	/			ELECTRON TUBE: MIL type 83			1		V101
6240-179-1814	/	/	/	/			LAMP, GLOW: GE p/n NE-45			1		E101
6240-014-2306	/	/	/	/			LAMP, INCANDESCENT: GE p/n 81			1		E103
6240-155-8706	/	/	/	/			LAMP, INCANDESCENT: GE p/n 47			1		E102

Page 37, Appendix III. Delete and substitute.

APPENDIX III
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance category.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part of component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) are listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the categories.

(*a*) *Service.* To clean, to preserve, and to replenish lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Overhaul.* To restore an item to *completely serviceable* condition as prescribed by serviceability standards developed and published by heads of commodity commands. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(*j*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the

item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *Operator, organization, direct support, general support and depot.* The symbol X indicates the categories responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Categories higher than those marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *Operator, organization, direct support, general support and depot.* The dagger (†) symbol indicates the categories normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by electronic services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to an including general support are authorized to the organization operating this equipment.

SECTION II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON O/C	ECHELON O	ECHELON DS	ECHELON GS	ECHELON D	TOOLS REQUIRED	REMARKS
TEST SET ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
			X				8	Repair consists of replacing electron tubes, fuses, lamps, knobs and other easily replaced items
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	MAINTENANCE CATEGORY O/C	O	DS	GS	D	TOOL CODE	REMARKS
TV-7/U; TV-7A,B,D/U (continued)							
MULTIMETER TS-352/U				/	/	1	
RESISTOR DECADE ZM-16/U				/	/	2	
TEST SET ELECTRON TUBE TV-7/U				/		3	
TEST SET ELECTRON TUBE TV-2/U					/	4	
KIT, RADIO REPAIRMAN TK-87/U				/	/	5	
TRANSFORMER VARIABLE CN-16/U				/	/	6	
VOLTMETER, METER ME-30/U				/	/	7	
TOOL AND TEST EQUIPMENT AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		/				8	

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:
Active Army:

USASA (2)
CNGB (1)
CC-E (7)
Dir of Trans (1)
CofEngrs (1)
TSG (1)
CofSptS (1)
USAIB (5)
USARADBD (5)
USAAESWBD (5)
USAAVNTBD (5)
USACDCEA (1)
USACDCBRA (1)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
USACDCADA (1)
USACDCARMA (1)
USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
USACDEC (10)
USAMC (5)
USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Comd (4) except
  USAREUR (5)
LOGCOMD (2)
USAMICOM (4)
USASMC (2)
USASCC (4)
USAECOM (17)
USASPTCP (30)
MDW (2)
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  4th USA (5)
  EUSA (5)
507th USASA Gp (5)
508th USASA Gp (5)
318th USASA Bn (5)
319th USASA Bn (5)
320th USASA Bn (5)
177th USASA Co (5)
182nd USASA Co (5)
183rd USASA Co (5)
184th USASA Co (5)
251st USASA Co (5)
102nd USASA Det (5)
104th USASA Det (5)
400th USASA Det (5)
401st USASA Det (5)
402nd USASA Det (5)
403rd USASA Det (5)
Instl (2) except
  Ft Monmouth (70)
  Ft Hancock (4)
  Ft Gordon (10)
  Ft Huachuca (10)
  WSMR (5)
  Ft Carson (19)
  Ft Knox (12)
  Ft Lee, Va. (5)
  JCA, Ft Ritchie (5)
  Ft Devens (5)
  USATCFE (5)
APG (5)
DPG (5)
USAEPG (5)
Yuma PG (5)
USMA (5)
Svc Colleges (2) except
  USAWC (5)
Br Svc Sch (2) except
  USACMLCS (5)
  USAIS (5)
  USAOC&S (5)
  USACSS (5)
  USASCS (5)
  USAARMS (5)
  USAADS (5)
  USATSCH (5)
  USAAVNS (5)
USATC Armor (2)
USAECFB (7)
USATC Inf (2)
USASTC (2)
USAMEDTC (5)
Army Dep (2) except
  LBAD (14)
  SAAD (30)
  TOAD (14)
  FTWOAD (10)
  LEAD (7)

SHAD (3)
NAAD (5)
SVAD (5)
CHAD (3)
ATAD (10)
GCAD (5)
ERAD (5)
PUAD (5)
PRAD (5)
SEAD (5)
MEAD (5)
SCAD (5)
UTAD (5)
Gen Dep (2)
Sig Sec, Gen Dep (5)
Sig Dep (12)
USASETAF (5)
1st FA Msl Bde (5)
1st GM Bde (5)
AAF, CONUS (5)
MGH (5)
LGH (5)
WBGH (5)
VFGH (5)
BAMC (5)
Watervliet Arsenal (5)
Edgewood Arsenal (5)
MAAG (Vietnam) (5)
MAAG (Iran) (5)
MAAG (Rep of China) (5)
MAAG (Thailand) (5)
KMAG (5)
USACA, Taiwan (5)
GENMISH (5)
JUSMMAT (5)
USMTMSA (5)
USARMIS
Honduras (5)
Guatemala (5)
Chile (5)
Venezuela (5)
Paraguay (5)
Bolivia (5)
Ecuador (5)
Columbia (5)
El Salvador (5)
USDB (5)
USAG, Arlington Hall (5)
AH (USARPAC) (5)
Sig FLDMS (2)
AMS (1)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
NLABS (5)
USAPA (5)
MM Sig Spt Fac (5)
WRAMC (1)
AFIP (5)
Army Pic Cen (2)
USAINTC (5)
USATTC (5)
Av Comm Cen (5)
USAJFKCENSPWAR (5)
1st USASA Fld Sta (5)
2nd USASA Fld Sta (5)
3rd USASA Fld Sta (5)
4th USASA Fld Sta (5)
5th USASA Fld Sta (5)
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13th USASA Fld Sta (5)
14th USASA Fld Sta (5)
15th USASA Fld Sta (5)

Units org under fol TOE:—2 ea.

1-7	5-64
1-37	5-78
1-47	5-112
1-55	5-115
1-56	5-116
1-57	5-118
1-58	5-127
1-59	5-137
1-75	5-145
1-76	5-146
1-77	5-147
1-78	5-148
1-100	5-155
1-101	5-156
1-102	5-157
1-107	5-278
1-127	5-348
1-128	5-401
1-137	5-600
1-145	5-605
1-146	5-617
1-147	5-627
1-148	6-37
1-155	6-100
1-156	6-101
1-157	6-155
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1-165	6-165
1-166	6-166
1-167	6-175
1-207	6-176
1-256	6-185
1-257	6-186
1-258	6-200
1-307	6-201
3-7	6-215
3-266	6-216
3-267	6-300
5-7	6-302
5-25	6-315
5-26	6-316
5-27	6-345
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5-36	6-355
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5-52	6-386

6-401
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8-25
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8-137
8-500(AA-AH)
9
9-22
9-47
9-86
9-87
9-227
9-377
9-500(AA-AC)
10-22
10-105
10-106
10-201
10-202
10-206
10-377
10-445
10-446
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11-357
11-358
11-377
11-500(AA-AC) (FH, FJ, FK, FO, FP, FQ, FR, GH, GI, GR, KA, KC, NA, NB, NC, RA, RB, RC, RD, RF, RH, RI, RK, RL, RM, RO, RP, RQ, RR, RS, RT, RU, TC, TE, TF, TG, TK)
11-587
11-592
11-597
11-608
12-17
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17-206
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17-208
17-408
19-27
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19-57
19-67
19-87
19-97
19-217
19-500(AA-AE), EA, OA
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29-1
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29-105
29-106
29-109
29-407
29-500(GF, GH, GI)
29-701
30-25
30-26
30-28
30-29
31-105
31-107
32-52
32-56
32-57
32-67
32-68
32-77
32-78
32-500
33-56
33-500(FB, HB, IB, IC, KD)
33-600(AA-AC), IA
37
37-4
37-42
37-100
37-102
39-51
39-52
39-401
44-2
44-8
44-12
44-85
44-86
44-87
44-102
44-112
44-235
44-236
44-237
44-500
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44-546
44-547
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44-568
44-500(FA)
45-520
47
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55-458
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57-4
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57-100
57-102

NG: State AG (3)—Units same as Active Army except allowance is one (1) copy each.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1966—254425/196

TECHNICAL MANUAL
No. 11-6625-274-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *14 June 1960*

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		
		Scope	1	3
		Forms and records	2	7
	II.	Description and data		
		Purpose and use	3	7
		Technical characteristics	4	7
		Table of components	5	7
		Description of test set	6	8
		Differences in models	7	8
CHAPTER	2.	INSTALLATION AND OPERATING INSTRUCTIONS		
Section	I.	Service upon receipt of equipment		
		Unpacking	8	10
		Checking unpacked equipment	9	11
	II.	Controls and indicator		
		General	10	11
		Controls, indicators, and jacks	11	11
	III.	Operation under usual conditions		
		General instructions	12	13
		Test leads	13	14
		Tube test sockets	14	14
		Tube test data	15	14
		Adapters	16	15
	IV.	Operating test set		
		Starting procedure	17	16
		Operating procedure	18	16
		Checking filament continuity (12-volt Filament tubes)	19	17
		Reading meter	20	18
		Gas test	21	18
		Noise test	22	19
		Panel lamp test	23	19
		Testing special tube types	24	19
		Testing subminiature tubes	25	19
		Stopping procedure	26	20

*This manual supersedes so much of TM 11-5083, 29 September 1953, including C1, 2 September 1955; C2, 8 February 1956, and C3, 1 April 1959, as pertains to operation and organizational maintenance; so much of C4, 26 August 1959, as pertains to packaging and repackaging; TM 11-6625-274-10P, 11 June 1959, and so much of TM 11-6625-274-20P, 11 June 1959, as pertains to the maintenance allocation chart.

			Paragraph	Page
	V.	Operation under unusual conditions		
		General	27	20
		Operation at low temperatures	28	21
		Operation under tropical conditions	29	21
		Operation in desert climates	30	21
CHAPTER	3.	MAINTENANCE INSTRUCTIONS		
		General	31	22
		Materials required	32	22
		Preventive maintenance	33	22
		Visual inspection	34	25
		Equipment performance checklist	35	25
		Removal of chassis	36	27
		Tube replacement	37	27
		Preferred-type tubes	38	28
		Replacement of lamps	39	28
CHAPTER	4.	SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE		
Section	I.	Shipment and limited storage		
		Removal from service	40	30
		Repackaging for shipment or limited storage	41	30
	II.	Demolition of materiel to prevent enemy use		
		Authority for demolition	42	32
		Methods of destruction	43	32
APPENDIX	I.	REFERENCES		33
	II.	OPERATOR'S MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST		34
	III.	MAINTENANCE ALLOCATION CHART		37

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Sets, Electron Tube TV-7/U (fig. 1), TV-7A/U (fig. 2), TV-7B/U (fig. 3), and TV-7D/U (fig. 4), and covers installation, operation, and first and second echelon maintenance. It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to first and second echelon maintenance personnel.

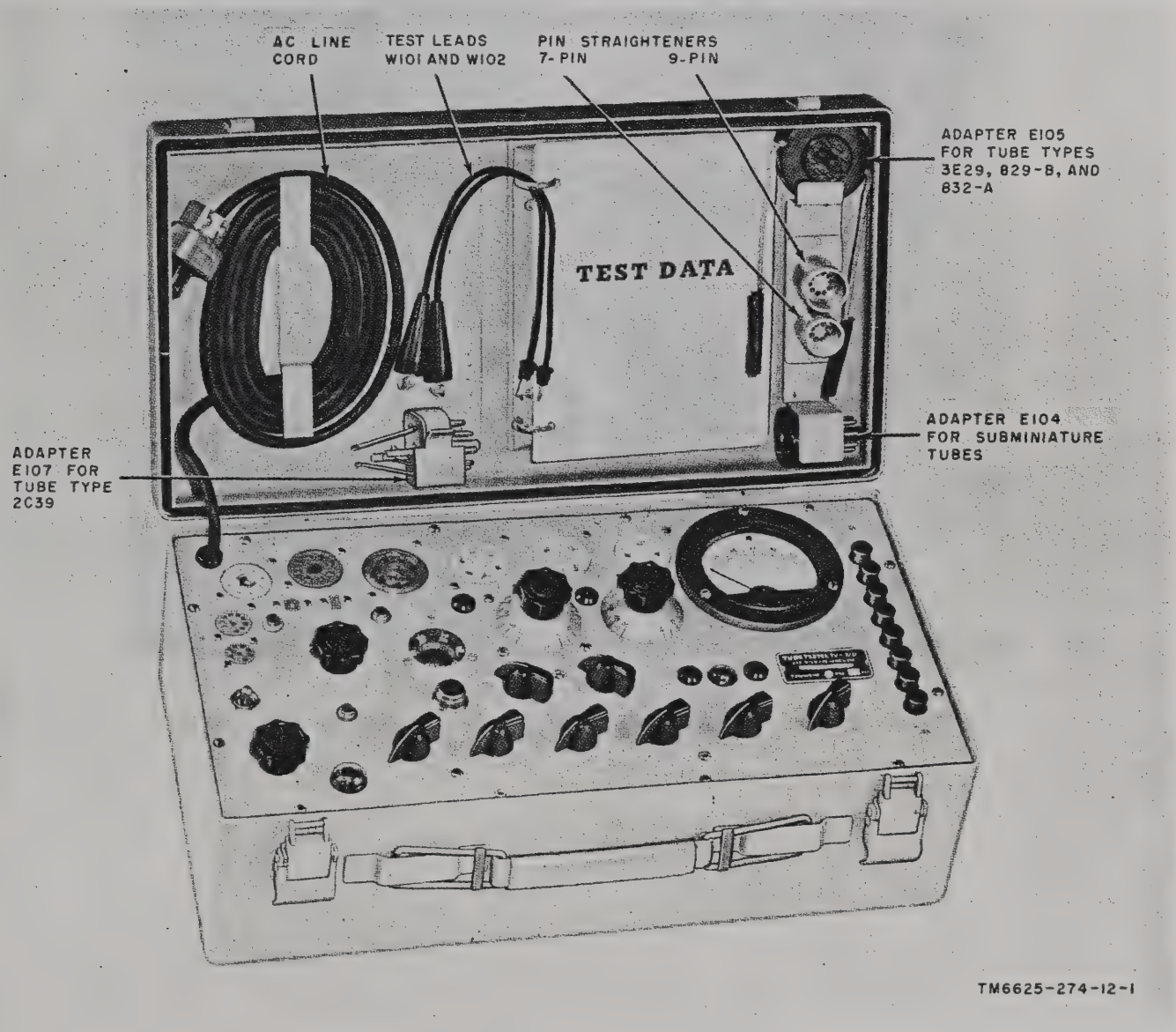

Figure 1. Test Set, Electron Tube TV-7/U, less running spares.

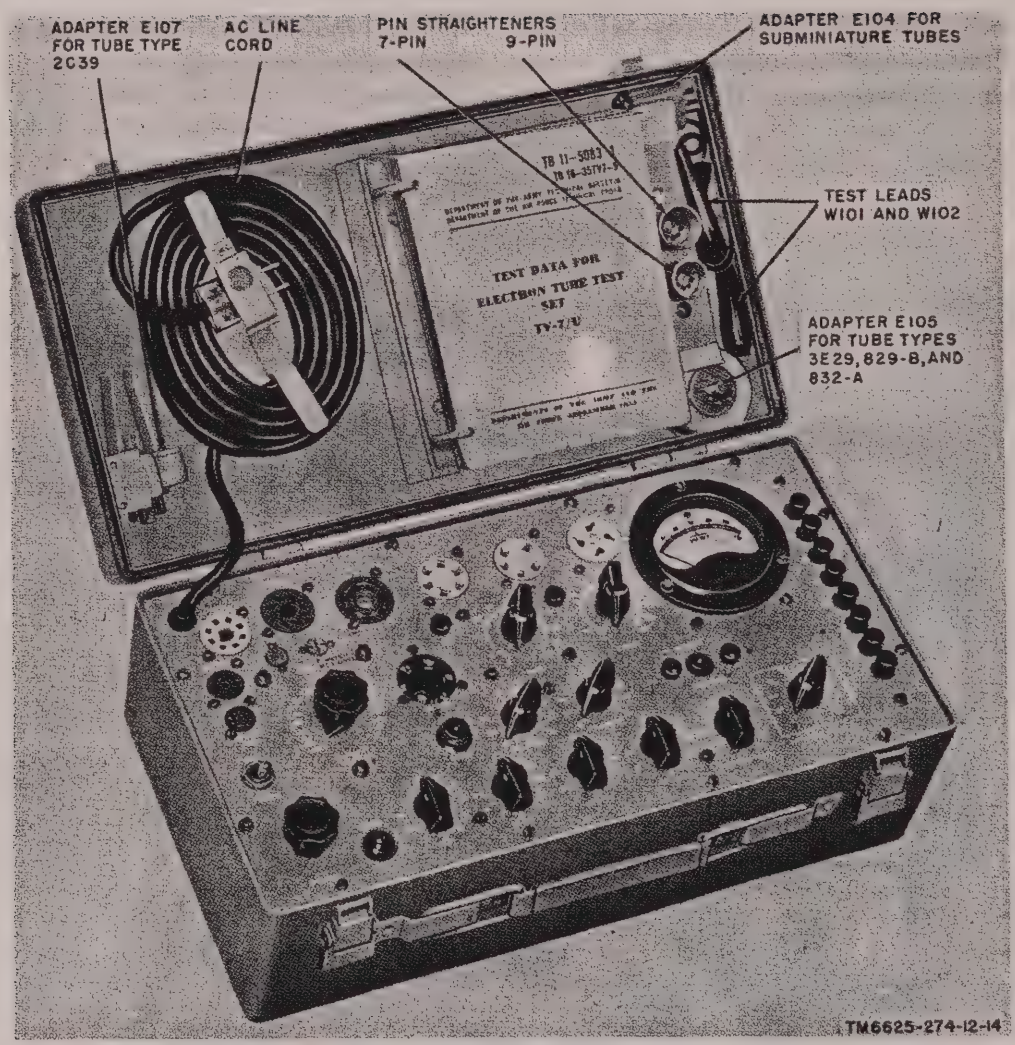
ADAPTER E107 FOR TUBE TYPE 2C39
AC LINE CORD
PIN STRAIGHTENERS 7-PIN 9-PIN
ADAPTER E104 FOR SUBMINIATURE TUBES
TEST LEADS W101 AND W102
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST DATA FOR ELECTRON TUBE TEST SET TV-7/U
TM6625-274-12-14

Figure 2. Test Set, Electron Tube TV–7A/U, less running spares.

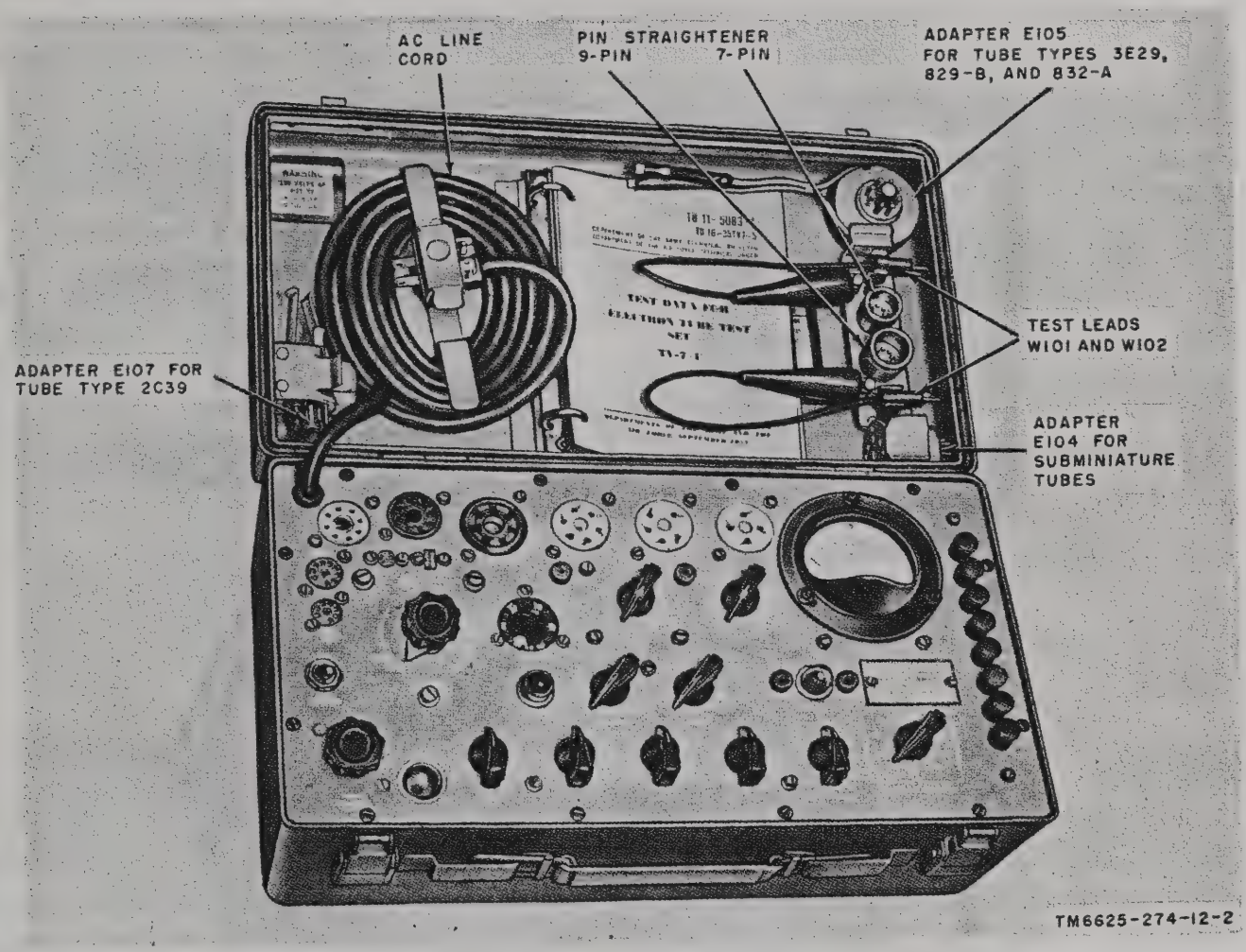
AC LINE CORD
PIN STRAIGHTENER 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER E104 FOR SUBMINIATURE TUBES
TM6625-274-12-2

Figure 3. Test Set, Electron Tube TV–7B/U, less running spares.

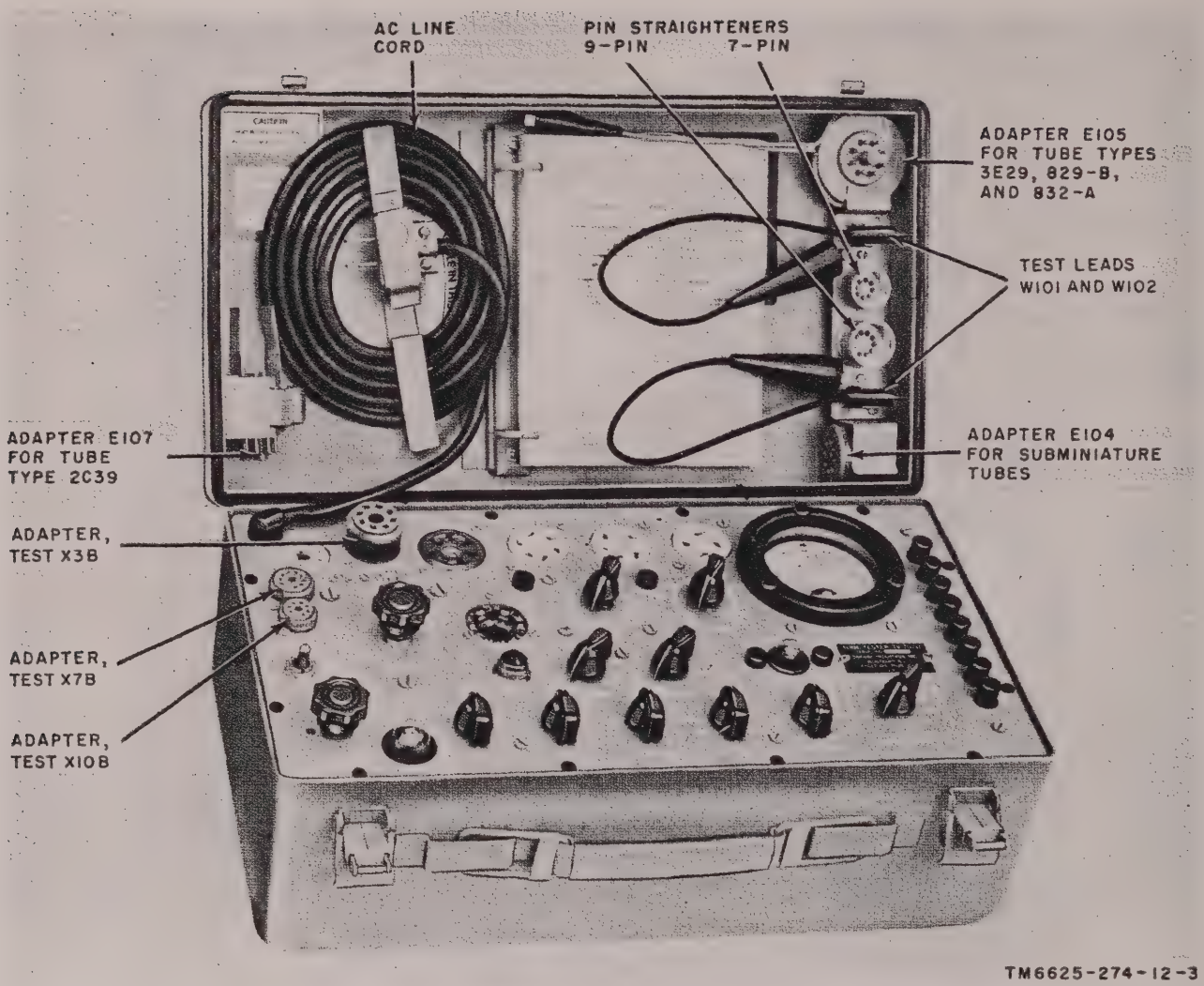
AC LINE CORD
PIN STRAIGHTENERS 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER, TEST X3B
ADAPTER, TEST X7B
ADAPTER, TEST X10B
TM6625-274-12-3

Figure 4. Test Set, Electron Tube TV–7D/U, less running spares.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Test Set, Electron Tube TV-7(*)/U represents Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

2. Forms and Records

a. Electronic Failure Report. Fill out and forward DD Form 787-1, Electronic Failure Report-Signal Equipment, to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-39.

b. Unsatisfactory Equipment Report. Fill out and forward AF TO Form 29, Unsatisfactory Report, to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

c. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6, Report of Damaged or Improper Shipment, as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

d. Preventive Maintenance Form. Prepare DA Form 11-266 (fig. 11 and 12), Maintenance Check List for Signal Equipment (Test Equipment), in accordance with instructions on the form.

e. Parts List Form. Any comments concerning omissions and discrepancies in appendix II or III in this manual will be prepared on DA Form 2028 and forwarded directly to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J. ATTN: SIGFM/ES-ML.

f. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Test Set, Electron Tube TV-7(*)/U is a portable tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limits for electron tubes used in receivers, low-powered transmitters, and many other electronic equipments. The following tests can be made with Test Set Electron Tube TV-7(*)/U:

a. Continuity test (ballast tubes).

b. Dynamic mutual conductance test (amplifier tubes).

c. Emission test (rectifier tubes).

d. Gas test (amplifier tubes).

e. Noise test.

f. Panel lamp test.

g. Shorts test.

4. Technical Characteristics

Power Supply:	
Input voltage	103.5 to 126.5 volts ac, single phase.
Frequency	50 to 1,000 cps.
Power consumption ..	45 watts at 115 volts, 50 cps.
Meter	0 to 120 arbitrary units.
Operating temperature limits	—40° to +125° Fahrenheit.
Number of tubes	2.
Indicator lights:	
PILOT	One type 47.
SHORTS	One type NE-45.
FUSE	One type 81.

5. Table of Components

The components of Test Set, Electron Tube TV-7(*)/U are listed in *a* below and the spare parts in *b* below.

a. Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Length	
1	Test set including tubes and lamps	6 1/16	8⅜	15⅝	18
1	Adapter E105: 3E29, 829-B or 832-A tubes				
1	Adapter E107: 2C39 tube				
1	Adapter E104: Subminiature tubes				
1	Adapter X10B: socket saver, 7-pin miniature (TV-7D/U)				
1	Adapter X7B: socket saver, 9-pin miniature (TV-7D/U)				
1	Adapter X3B: socket saver, octal (TV-7D/U)				
2	Test leads				
1 set	Running spares (*b* below)			15	

b. Spare Parts.

Quantity	Item
1	Electron tube, type 5Y3WGTA
1	Electron tube, type 83
1	Lamp, neon NE-45
1	Lamp, incandescent No. 47
1	Lamp, incandescent No. 81

6. Description of Test Set

(fig. 1-4)

a. Test Set, Electron Tube TV-7(*)/U (test set) is self-contained in a carrying case equipped with a carrying handle. The cover is secured to the case by luggage-type fasteners. Retainer brackets on the inside of the cover are used to secure and store the power cable, pin straighteners for 7- and 9-pin miniature tubes, and adapters (par. 16). A ring binder inside the cover holds TB 11-5083-1 (tube test data book (par. 15)). The cover is hinged by slip hinges and can be removed from the case.

b. An indicating meter and all controls, knobs, pushbuttons, sockets, and indicating lamps are on the front panel. The necessary data for setting and operating the controls to test the various tube types are contained in the tube test data book (*a* above). One end of the alternating current (ac) line cord is permanently attached to the panel; the other end terminates in a male plug.

7. Differences in Models

Test Sets, Electron Tube TV-7(*)/U are similar in purpose, operation, and appearance. Some models have been modified to improve operational features. External differences are as follows:

Item	TV-7/U	TV-7A/U	TV-7B/7	TV-7D/U
F RANGE on FUNCTION SWITCH.	Not used.	Not used.	Not used.	Used.
BIAS and SHUNT controls	Markings engraved on a dial.	Markings etched into test set panel.	Markings etched into test set panel.	Markings etched into test set panel.
SHORTS lamp	No panel marking.	Panel marking.	Panel marking.	Panel marking.
Subminiature tube test socket X109.	Rectangular.	Round on some equipments.	Rectangular.	Rectangular.
Storage clip for ac line cord plug.	Not used.	Used.	Used.	Used.
Storage clips for test leads	Not used.	Not used.	Used.	Used.
Tip of test lead plug (2 each)	3/32-inch diameter.	5/64-inch diameter.	3/32-inch diameter.	3/32-inch diameter.

Item	TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
Grid (G), plate (P), and NOISE jacks.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 5/64-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.
Gasket around edge of cover	Not used.	Used.	Used.	Used.
Socket saver adapters X10B, X7B, and X3B, 7-pin and 9-pin miniature and octal base.	Not provided.	Not provided.	Not provided.	Provided.

210-846 O - 66 - 2

CHAPTER 2
INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the test set is packaged in an inner fiberboard carton. Spare parts are in a small, corrugated carton, protected by a sleeve on top of the test set. The inner fiberboard carton is sealed with gummed tape, and is then placed within an outer fiberboard carton, with all seams and joints sealed with water-resistant, pressure-sensitive tape. A wooden packing case may also be used when a multiple of four test sets is shipped. The wooden packing case will be strapped only for intertheater shipment. A typical packing case and its contents are shown in figure 5.

(1) The inside dimensions of a packing case that contains four packaged test sets is approximately 18¾ by 20½ by 15¾ inches; the volume is 4.8 cubic feet, and the weight is 106 pounds.

(2) The outside dimensions of a test set packed in fiberboard cartons is 21½ by 10⅞ by 8½ inches; the volume is

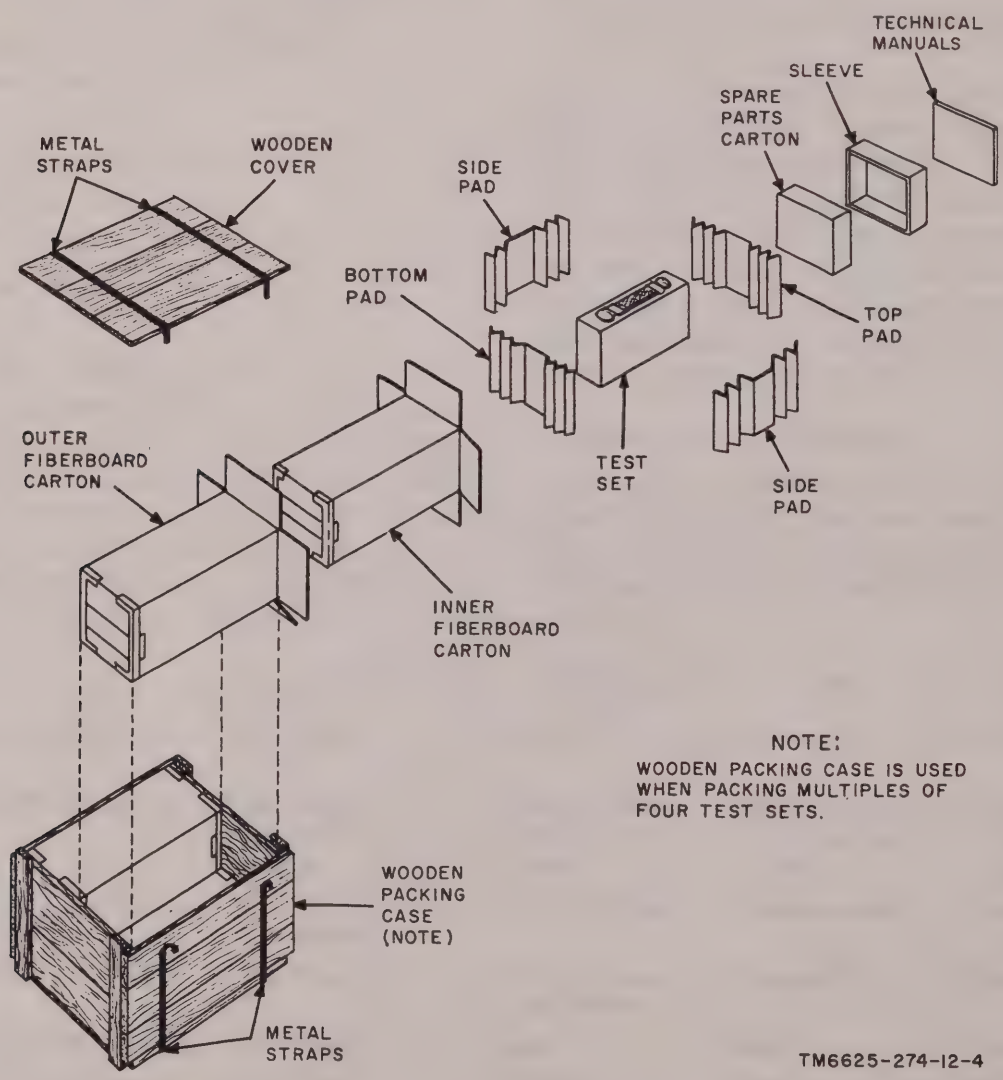

Figure 5. Typical packaging.

1.2 cubic feet, and the weight is 21½ pounds.

b. Removing Contents.

(1) Cut and fold back the metal straps (when used).

(2) Remove the nails from the wooden cover and one side of the wooden packing case with a nailpuller. Remove the cover and the side. Do not attempt to pry off the cover or the side; prying may damage the equipment.

(3) Remove the envelope that contains the technical manuals.

(4) Remove the outer fiberboard carton from the wooden packing case.

(5) Open the outer fiberboard carton and remove the inner fiberboard carton.

(6) Open the inner fiberboard carton and remove the contents.

9. Checking Unpacked Equipment

Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (par. 5) as a general check. If the equipment is damaged, refer to paragraph 2. After a test set is removed from its fiberboard container, release the fasteners, open the cover, and proceed as follows:

a. Check to see that the adapters (fig. 8) are held firmly to the cover.

b. Check all controls for ease of rotation. Tighten loose knobs.

c. Check for a broken meter glass and broken lamps.

d. Check the ac line cord, test leads, and rubber gasket around the edge of the cover (except on TV-7/U) for signs of deterioration.

Section II. CONTROLS AND INDICATORS

10. General

Improper setting of the FILAMENT VOLTAGE switch (fig. 6) or incorrect operation of the pushbutton switches may damage the tube under test. Be sure that all the controls and switches are set properly before testing tubes.

11. Controls, Indicators, and Jacks

a. Switches and Controls.

Switch or control	Function
POWER switch	ON: Connects ac power to test set. OFF: Removes ac power from test set.
FILAMENT VOLTAGE (20-position rotary switch)	Provides an 18-step selection of filament voltages from 0.6-volt to 117 volts ac. BLST.: Enables ballast tubes to be tested for continuity and supplies voltage to certain rectifier tubes for emission tests.
	OFF: Removes voltage from FILAMENT VOLTAGE switch.
FILAMENT selectors, left and right (10-position, 5-section rotary switches)	Connects filament of tube under test to filament voltage supply.
GRID selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects control grid of tube under test to bias and signal voltages.
PLATE selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects plate of tube under test to plate voltage supply.
SCREEN selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects screen grid of tube under test to screen voltage supply.
CATHODE selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects cathode of tube under test to desired test circuit.
SUPPRESSOR selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects suppressor grid of tube under test to desired test circuit.

Switch or control	Function
FUNCTION SWITCH (11-position, 8-section rotary switch (TV–7D/U), 10-position, 6-section rotary switch on all other models)	SHORTS: Positions 1-5 connect various elements of tube under test to shorts test circuit. RANGES: Positions A-E (A-F, TV–7D/U) control sensitivity of meter circuit and magnitude of signal voltage.
LINE ADJUST control	Adjusts amount of input voltage to power transformer.
BIAS control	Adjusts amount of bias voltage applied to tube under test.
SHUNT control	Adjusts sensitivity of meter circuit.

b. Pushbutton Switches.

Pushbutton switch	Function	
	Switch position	*Action*
1—LINE ADJ.	Depressed	Connects meter into line test circuit.
	Normal	Disconnects meter from line test circuit.
2—DIODE	Depressed	Connects diode tube under test to an ac test voltage, and connects low screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed.[a]
	Normal	Removes ac test voltage from diode under test and connects normal screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed.
3—MUT. COND.	Depressed	Connects tube under test to plate and screen grid (when required) voltages.
	Normal	Removes plate and screen grid (when used) voltages from tube under test.
4—GAS 1	Depressed	Connects ac test voltage to certain diode tubes and connects plate voltage and bias voltage to tube under test when checking amplifier tubes for gas.
	Normal	Removes diode test voltage or plate voltage and bias voltage from amplifier tube under test.
5—GAS 2 (used with 4—GAS 1 when amplifier tubes are tested for gas)	Depressed	Connects a resistor into control grid circuit of tube under test.
	Normal	Short-circuits resistor in control grid circuit of tube under test.
6—OZ4	Depressed	Connects tube under test to an ac test voltage.[a]
	Normal	Removes ac voltage from tube under test.
7—RECT.	Depressed	Connects tube under test to an ac test voltage.[a]
	Normal	Removes ac voltage from tube under test.
8—METER REV.	Depressed	Reverses polarity of voltage applied to meter.
	Normal	Permits normal polarity of voltage to be applied to meter.

[a] Voltage will vary slightly, depending on LINE ADJUST setting.

c. Meter, Indicator Lamps, and Jacks.

Note. The jacks on the TV–7A/U accommodate 5/64-inch diameter tip plugs; the jacks on all other models of the test set accommodate 3/32-inch diameter tip plugs.

Meter, indicator lamp, or jack	Function
Meter	Indicates condition of tube under test. A LINE TEST mark at midscale is used to establish correct input voltage to power transformer.
SHORTS lamp (not a panel marking on TV–7/U)	Indicates and locates shorted tube elements.
PILOT lamp	Indicates when power is delivered to test set.
FUSE lamp	A fuse and an overload indicator.
Grid (G) and plate (P) jacks	Provide a means of connecting grid and plate test leads to bias and plate voltage circuits, respectively.
NOISE test jacks (2)	Enables test set operator to check level of noise generated by tube under test.

Section III. OPERATION UNDER USUAL CONDITIONS

12. General Instructions

Do not operate the test set until the functions of the controls and the indicators (par. 11), the operating procedure (par. 18), and the use of the test data book (par. 15) are understood. Refer to paragraph 24 whenever a special testing procedure is indicated in the test data book.

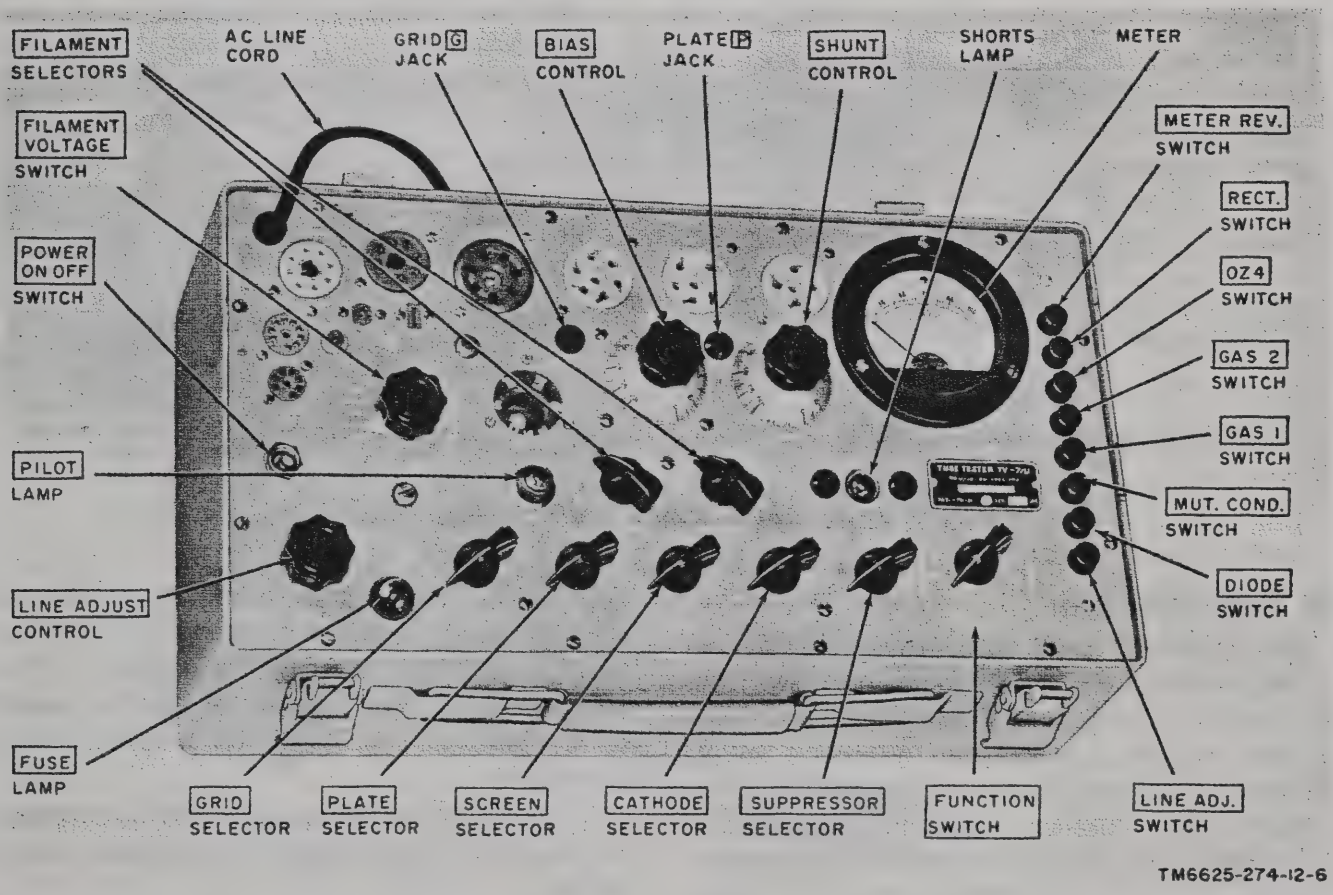

Figure 6. Test Set, Electron Tube TV–7/U, front panel.

13. Test Leads

Two test leads are provided to make connections from the grid (G) and the plate (P) panel jacks to the top caps of tubes under test. Each test lead is terminated on one end in a 3/32-inch diameter tip plug(5/64-inch on TV-7A/U) and on the other end in a battery-type clip with an insulating cover. The test leads are stored inside the cover of the test set case.

14. Tube Test Sockets

(fig. 7)

After the controls on the test set have been set as directed in the tube test data book (par. 15), place the tube to be tested in the proper tube test socket listed below. Socket-saver adapters (par. 16*d*) are mounted in the 7- and 9-pin miniature sockets and in the octal socket on the TV-7D/U (fig. 4).

Tube test socket	Tube type tested
4 pin	Four-pin standard tubes.
5 pin	Five-pin standard tubes.
6 pin	Six-pin standard tubes.
7 pin	Seven-pin standard tubes and panel lamps.
OCTAL	Octal (8-pin) tubes.
LOKTAL	Loktal base (8-pin) tubes.
SUB MIN. (2)	Round (8-pin) or flat-type (7-pin) subminiature tubes.
NOVAL	Nine-pin miniature tubes.
7 PIN MIN	Seven-pin miniature tubes.
ACORN	Acorn type tubes.

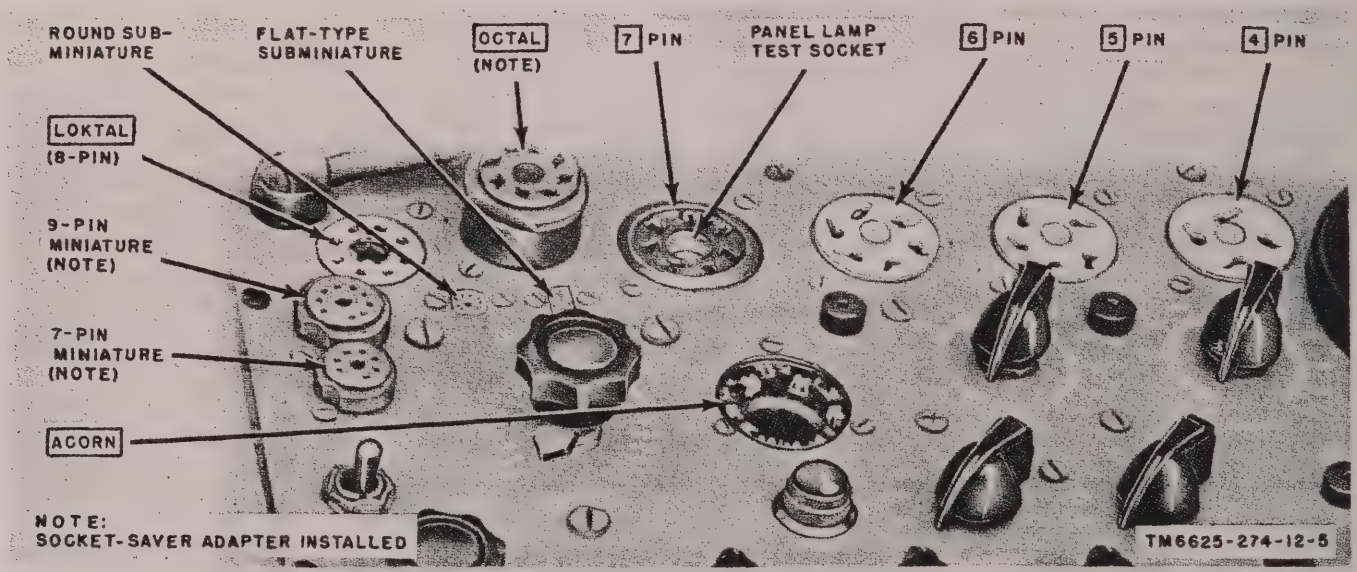

Figure 7. Test sockets, socket-saver adapters installed.

15. Tube Test Data

TB 11-5083-1 (test data book) is mounted on the inside of the cover of the test set. The test data book contains operating instructions for the test set, information necessary to set the controls when testing various tube types, a conversion table for VT tube designations, and a data table for CV type tubes. The control settings for the various tube types are tabulated in nine columns. Read the headings from left to right as follows:

a. Tube Type. Type numbers of electron tubes which the test set is designed to test are listed numerically and alphabetically in this column. Tubes that have type letters instead of numbers, such as XXB, are listed at the end of the table.

b. Fil. Correct filament or heater voltages for the listed tube types are shown in this column.

c. Selectors. The correct setting for the two FILAMENT selectors and the GRID, PLATE,

SCREEN, CATHODE, and SUPPRESSOR selectors are listed in this column. The settings are shown in the same order in which the switches appear on the panel, listing first the two FILAMENT selectors and then continuing, from left to right, with the remaining selectors.

d. Bias. This column lists the setting for the BIAS control.

e. Shunt. This column lists the setting for the SHUNT control. Setting of this control is required only when the FUNCTION SWITCH is in the RANGES A SHUNT position.

f. Range. The settings for the FUNCTION SWITCH are listed in this column. The letters A through E (A through F, TV-7D/U) correspond to the RANGES markings for the FUNCTION SWITCH.

g. Press. Under this heading are listed the test pushbuttons that are used for the various tube types and their individual sections in the case of multipurpose tubes.

h. Min Value. The minimum, numerical values of meter indication for the various tubes and individual sections of multipurpose tubes are shown in this column. Any tube showing a meter reading less than the value indicated in this column should be replaced.

i. Notations. Special information pertaining to particular tube types is listed under this heading.

16. Adapters

a. Adapter E104. Adapter E104 (fig. 8) enables subminiature tubes with long leads to be tested in the OCTAL socket of the test set. A spring locking action grips the leads of the tube after they are inserted in the adapter. Pull the two tabs upward to open the lock before inserting the leads. The lock is secured by pressing down on the two tabs until a click is heard.

b. Adapter E105. Adapter E105 (fig. 8) enables tube type 3E29, 829-B, or 832-A to be tested in the OCTAL socket of the test set. The adapter consists of a special socket for these tubes mounted on an octal base. The two leads on the adapter connect to the two plate caps of the tube under test.

c. Adapter E107. Adapter E107 (fig. 8) enables tube type 2C39 (a lighthouse tube) to be tested in the OCTAL socket of the test set. The three pairs of spring contacts, from the center outward, connect to the cathode and one side of the filament, to the grid, and to the plate, respectively, of the tube under test. The center contact connects to the other side of the filament of the tube under test.

d. *Socket-Saver Adapters (TV-7D/U).* Three socket-saver adapters (fig. 7) are included with each TV-7D/U: one 7-pin miniature, one 9-pin miniature, and one octal. The adapters are installed in their corresponding sockets and receive the wear rather than the permanent socket. When worn so that satisfactory contact can no longer be made, the socket-saver adapters can be replaced without disconnecting the leads from their respective test socket.

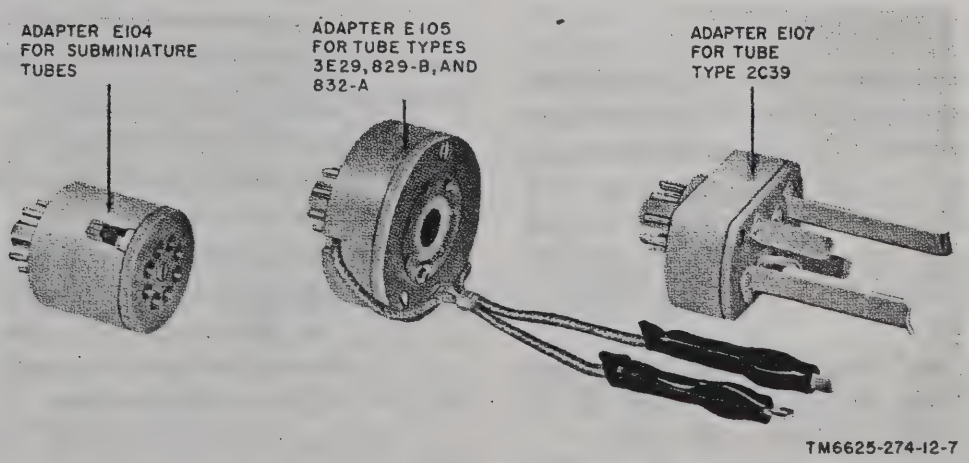

Figure 8. Adapters E104, E105, and E107.

17. Starting Procedure

Before operating the test set, perform the starting procedure below to check the general operation of the equipment. If the results obtained from the procedures in *b* through *e* below are satisfactory, the test set is ready for operation.

Note. If an abnormal indication is obtained during the starting procedure, refer to the equipment performance checklist (par. 35) for corrective measures.

a. Connect the test set to a 115-volt ac, 50- to 1,000-cycle per second (cps), power source.

b. Set the POWER switch to the ON position; the PILOT lamp should light.

c. Press pushbutton 1 — LINE ADJ. Rotate the LINE ADJUST control knob until the meter pointer rests over the LINE TEST mark on the meter face.

d. Release pushbutton 1 — LINE ADJ.

e. Check the short test circuit.

(1) Set the left FILAMENT selector at A, the right FILAMENT selector at P, and the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selectors at 0, 0, 0, 2, and 2, respectively.

(2) Rotate the FUNCTION SWITCH through the five SHORTS positions. The neon SHORTS lamp (fig. 6) should glow in positions 2 and 3 of the FUNCTION SWITCH to indicate that the short test circuit is functioning properly.

f. Set the POWER switch to the OFF position.

18. Operating Procedure

The procedures below apply to single-section and multipurpose tubes (tubes that have more than one set of elements in the same envelope). Test each section or group of elements of a multipurpose tube separately. Test data for the multipurpose tube types are listed by sections (pentode sect., triode sect., diode sect., etc) in the test data book.

***Caution:* Do not insert a tube into a test socket until all the controls have been set in accordance with the instructions below.**

a. Selectors. The FILAMENT (left and right), GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches select the test socket connections so that correct test voltages are applied to the elements of the tube under test. For clarity, these selector switches will, in some instances, be referred to collectively as "the selectors". When referred to collectively, they are considered in the same order as above.

b. Setting Controls.

(1) Locate the type number of the tube to be tested in the test data book (fig. 1-4).

(2) Turn the FILAMENT VOLTAGE knob to the position shown in the *Fil* column of the test data book.

(3) Set the selectors to the letters and the numbers indicated in the *Selectors* column in the test data book. Be sure the numbers indicated by the selector knobs are the same, if read from left to right, as the numbers in the test data book.

Example: To test a tube type 6SN7, the *Selectors* column in the test data book indicates that the selectors are to be set at HY4-5062. Start at the left and turn the FILAMENT (left) selector knob to H, and the FILAMENT (right) selector knob to Y. Turn the GRID selector knob to number 4; the PLATE selector knob to number 5; the SCREEN selector knob to number 0; the CATHODE selector knob to number 6; and the SUPPRESSOR selector knob to 2. The sequence of letters and numbers thus selected (HY4-5062) is identical with that listed in the test data book. The selectors are interconnected electrically so that two different voltages cannot be applied to the same tube pin at the same time. Therefore, accidental shorts are avoided.

(4) Set the BIAS control to the number indicated in the *Bias* column of the test data book.

(5) Set the SHUNT control to the number indicated in the *Shunt* column of the test data book. If no setting is indicated, disregard this step and proceed with the steps below.

(6) Set the FUNCTION SWITCH knob to 1.

(7) Insert the tube to be tested in the

proper test socket (fig. 7) and, if the instructions in the *Notations* column require it, connect panel jacks G or P to the tube caps with the test leads.

(8) Set the POWER switch to the ON position. The PILOT lamp should light.

Note. For tubes of the heater cathode type, allow approximately 5 to 10 seconds for the cathode to reach operating temperature before testing the tube.

(9) Adjust the meter pointer (par. 17*c* and *d*) to the LINE TEST mark on the meter scale.

Note. Some tubes, such as the 17DE4 and the 32ET5, require the meter pointer to be set at a position other than the LINE TEST mark. Refer to the *Notations* column of the test data book before testing the tube.

c. Shorts Test.

(1) Turn the FUNCTION SWITCH knob from position 1 to position 5; meanwhile tap the tube lightly and watch the neon SHORTS lamp on each switch position. Tubes with shorted elements will cause the lamp to glow.

Note. A list of tubes that are not to be tapped during the shorts test is contained in the test data book.

(2) A short is indicated by a steady glow on *both* halves of the SHORTS lamp. A flash when the switch is turned from one position to another does not indicate a defective tube. Intermittent flashing when the tube is tapped indicates the existence of loose elements which can cause noisy or erratic operation.

(3) Tubes that have more than one section, such as the 25D8, must be tested for shorts on each section.

(4) Discard a shorted tube without further tests.

Note. Some tubes will show a shorted condition on certain positions of the FUNCTION SWITCH even though they are good tubes. Check the *Notations* column in the test data book for remarks. "Short on 1 and 2" would mean that a short indication in positions 1 and 2 is normal.

(5) If the tube is not shorted, other tests may be performed as required.

d. Selection of Range. Turn the FUNCTION SWITCH knob from the SHORTS side of the switch to the RANGES position indicated in the test data book under the column headed *Range*. This automatically sets the sensitivity of the meter circuit to the proper level for the tube under test.

e. Operating Pushbuttons.

***Caution:* Do not press pushbutton 3 — MUT. COND. when testing rectifier tubes.**

(1) Press the pushbutton (par. 11*b*) that is indicated in the *Press* column of the test data book.

***Caution:* Release the pushbutton as soon as the meter pointer comes to rest and the meter indication is read. If the pushbutton is depressed too long, the tube under test may be damaged.**

(2) Refer to the *Notations* column for special information pertaining to specific tube types.

(3) When the correct pushbutton is depressed, the meter will indicate the condition of the tube. Compare the meter reading to the value indicated in the *Min value* column of the test data book.

19. Checking Filament Continuity (12-Volt Filament Tubes)

Certain electron tubes in the 12-series may have open filament center taps that may not affect the testing or the operation of these tubes, if the tube is used in a 12-volt filament circuit. The test set does not have a specific filament continuity test circuit. A visual check for filament continuity of tube types 12AT7, 12AU7, 12AV7, 12AX7, and 12AZ7 can be made as follows:

a. Perform the starting procedures (par. 17).

b. Set the FILAMENT VOLTAGE switch to 12.6.

c. Set the left and right FILAMENT selector switches to E and to V, respectively.

d. Set the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches each at zero.

210-846 O - 66 - 3

e. Insert the tube in its proper test socket and perform the procedures in paragraph 17*b* through *d*.

f. Observe the filament of the tube; both sides should be lighted.

Note. Do not prolong the continuity test; keep the filament lighted just long enough to make a thorough observation.

g. Set the POWER switch to the OFF position, and set the FILAMENT VOLTAGE switch to 6.3.

h. Set the left and right FILAMENT selector switches to K and V, respectively.

i. Perform the procedures in paragraph 17*b* through *d*.

j. Observe the filament of the tube; only one-half the filament should be lighted.

k. Set the POWER switch to the OFF position, and set the left and right FILAMENT selector switches to E and Z, respectively.

l. Perform the procedures in paragraph 17*b* through *d*.

m. Observe the filament of the tube; the other half of the filament should be lighted.

n. If the tube shows filament continuity, proceed to test the tube in accordance with the instructions in paragraphs 20 through 22.

20. Reading Meter

The meter scale is calibrated in divisions from 0 to 120. When the proper pushbutton is depressed, the meter pointer will indicate the condition of the tube under test as a numerical value. The numerical value of the meter reading is then compared to the minimum acceptable value in the *Min value* column in the test data book. If the number indicated on the meter is less than the listed minimum value, the tube should be replaced. The following chart may be used to convert the numerical value of the meter reading to mutual conductance in micromhos.

Meter reading	Corresponding value in micromhos			
	Range B	Range C	Range D	Range E (Note)
0	0	0	0	0
10	250	500	1,250	2,500
20	500	1,000	2,500	5,000
30	750	1,500	3,750	7,500
40	1,000	2,000	5,000	10,000
50	1,250	2,500	6,250	12,500
60	1,500	3,000	7,500	15,000
70	1,750	3,500	8,750	17,500
80	2,000	4,000	10,000	20,000
90	2,250	4,500	11,250	22,500
100	2,500	5,000	12,500	25,000
110	2,750	5,500	13,750	27,500
120	3,000	6,000	15,000	30,000

Note. Ranges E and F, TV–7D/U.

21. Gas Test

Pushbuttons 4 — GAS 1 and 5 — GAS 2 are used when testing amplifier tubes for gas content. Multipurpose tubes are tested for gas only on the amplifier sections; the gas test does *not* apply to diode sections or to rectifier tubes. Allow tubes of the filament type to warm up before testing the tube for gas content.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the controls as indicated in the test data book.

c. Insert the tube in the proper test socket and set the POWER switch to ON.

d. Hold down pushbutton 4 — GAS 1 and adjust the BIAS control (fig. 6) until the meter pointer indicates 10 on the scale.

Note. If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob until the meter reading is 100.

e. Hold down pushbutton 4 — GAS 1 and press pushbutton 5 — GAS 2.

f. If the tube contains gas, the meter pointer will move up the scale. A movement of more than 1 division on the scale indicates a gassy tube.

g. Turn off the test set (par. 26).

22. Noise Test

The NOISE test jacks on either side of the SHORTS lamp (fig. 6) are used when testing electron tubes for noise. A radio receiver or an audio amplifier with a loudspeaker, and a set of test leads, are required to perform the test.

a. Perform the starting procedures (par. 17).

b. Set the controls for the tube under test as indicated in the test data book, and set the POWER switch to ON.

c. Set the FUNCTION SWITCH to SHORTS 1.

d. Connect a test lead to each of the NOISE jacks.

e. Connect the test lead from the left-hand NOISE jack to the chassis of the radio receiver or the audio amplifier.

f. Connect the test lead from the right-hand NOISE jack to either the antenna of a radio receiver or to the input of an audio amplifier. Turn the radio receiver or the audio amplifier power switch to the on position.

g. Tap the tube under test while the FUNCTION SWITCH is turned from position 1 through position 5.

h. Intermittent disturbances within the tube which are too brief to register on the SHORTS lamp will be reproduced as static by the loudspeaker.

i. Turn off the test set (par. 26).

23. Panel Lamp Test

The receptacle in the center of the large, 7-pin socket (fig. 7) is used to check panel lamps.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the FILAMENT selector switches to HR.

c. Set the FILAMENT VOLTAGE switch to the proper voltage for the lamp to be tested. If the exact voltage is not known, set the FILAMENT VOLTAGE switch to 0.6 volt and increase the voltage as required.

d. Insert the lamp in the receptacle and press the center contact of the lamp firmly against the bottom of the receptacle; then tilt the lamp until the metal shell makes contact with the rim of the receptacle. A defective lamp will not light.

e. Turn off the test set (par. 26).

24. Testing Special Tube Types

a. Special Testing Procedures. Certain electron tubes, such as the 6CD7, 6DA5, 6360, and 6524, require a special testing procedure. The 1-megohm resistors required to test the 6CD7 and the 6DA5, and the 30-volt battery required to test the 6360 and the 6524, are not supplied with the test set. The selectors are set for the tube under test in the normal manner. However, *before* the POWER switch is set to the ON position, the resistors or the battery is connected to the test socket pins as directed in the test data book.

Caution: **Disconnect the 30-volt battery *before* resetting any of the selector switches.**

b. Voltage Regulators. When voltage regulator tubes are tested, sufficient voltage must be applied to ionize the gas and to cause the voltage regulator tube to conduct. Refer to the test data book for the proper use of the pushbuttons and for control settings.

c. Thyratrons. To test thyratrons, set the controls as indicated in the test data book. Press the proper pushbutton and adjust the BIAS control until the tube strikes; this is indicated by a glow between the tube elements and a sharp rise of the meter pointer. The limits of the bias voltage between which the tubes should strike are shown in the test data book. After the tube strikes, the condition of the tube is read on the meter.

d. Tuning Eye Tubes. Set the controls as indicated in the test data book. When the proper pushbutton is depressed, note the effect on the tuning eye and compare it to the data in the *Notations* column. When the eye is closed, a thin, bright line is observed; when the eye is open, a wide, dark area is observed.

25. Testing Subminiature Tubes

Subminiature tubes are tested in SUB. MIN. sockets X109 and X110 (fig. 9).

a. Subminiature tubes of the round type with short wire leads or pins are tested in special socket X110. This circular socket has eight contacts.

(1) Several basing arrangements (fig. 10) are used for these tubes. The arrows near several of the tube bases in figure 10 indicate the location of the dot on the base of the tube. Check the *Notations* column in the test data book; examine the tube and identify the basing. Use adapter E104 (par. 16*a*) when the subminiature tube has long leads.

(2) Insert the leads or pins in the corresponding contacts of socket X110. If the leads are long enough, set the POWER switch to the OFF position, grasp each lead about one-eighth inch from its end with the tips of a pair of long-nosed pliers, and insert the leads into the proper socket contacts. Set the POWER switch to the ON position and test the tube.

b. Subminiature tubes of the flat or in-line-contact type with pins or leads are tested in flat socket X109 (fig. 9). The tube pins or leads must be inserted so that the dot on the base of the tube is directly in line with the small, molded dot on the socket.

c. Subminiature tube types are identified in the test data book by a star beside the type number. The applicable basing for the various round types is indicated in the *Notations* column. The basing designation letter refers to the diagrams shown in figure 10.

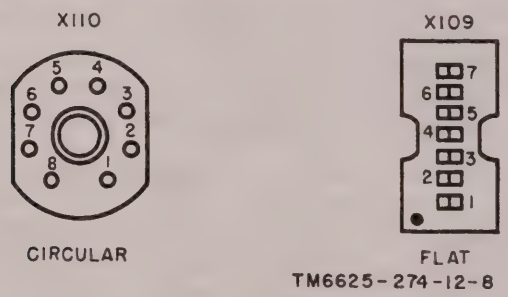

Figure 9. Top view of sockets X109 (flat) and X110 (circular).

26. Stopping Procedure

a. Set the POWER switch to the OFF position.

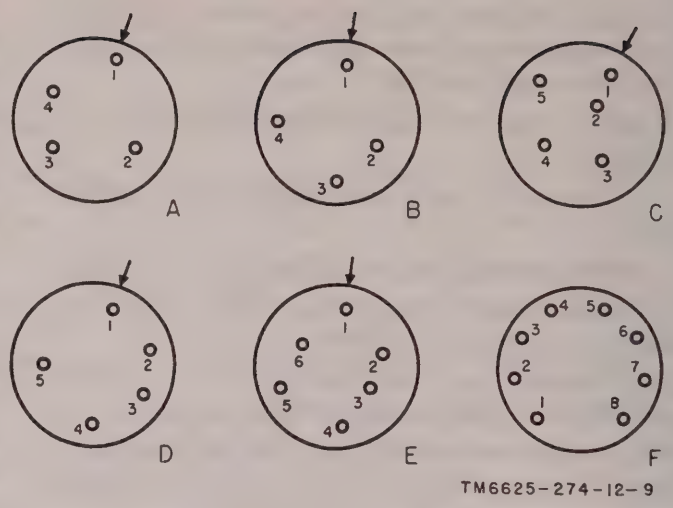

Figure 10. Basing diagrams for subminiature tubes (letters, A, B, C, D, E, and F identify basing for use with test data book).

b. Remove the tube under test from the test socket.

c. Place the adapters, if used, under the clamps on the inside of the cover.

d. Disconnect the ac line cord from the power source and wind it counterclockwise around the retainer bracket on the inside of the cover. Secure the plug under the storage clip (TV-7B/U and TV-7D/U, fig. 3 and 4), or under the coiled ac line cord (TV-7/U and TV-7A/U).

e. Place the test leads, if used, in the storage clips (not on TV-7/U). On the TV-7/U, store the test leads under the coiled ac line cord or as shown in figure 1.

f. Close the cover and secure the fasteners.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

27. General

The test set is designed for normal operation through a temperature range from —40° F to +125°F. The operation of the equipment may be more difficult in regions where extreme cold, heat, humidity, or moisture conditions prevail. Paragraphs 28 through 30 provide operational information that may be used to minimize the effects of regional extremes.

28. Operation at Low Temperatures

Subzero temperatures and climatic conditions associated with cold weather may effect the efficient operation of the test set.

a. Extreme cold makes the ac line cord and other rubber parts stiff and brittle. Handle the equipment carefully to avoid cracking the insulation on the ac line cord and on the test leads.

b. Keep the equipment in a warm, dry location. If possible, keep the test set in a heated enclosure. A standby heater is not provided; therefore, leave the test set turned on if possible.

c. Allow the test set to warm up for 10 to 15 minutes before testing tubes. The length of warmup time depends upon the temperature of the surrounding air.

d. If equipment that has been exposed to the cold is brought into a warm room, moisture will form on it and may cause fogging of the meter glass. Dry the equipment thoroughly.

e. Keep the cover of the test set closed at all times when the equipment is not in operation. This will prevent an accumulation of moisture within the equipment due to sweating.

29. Operation Under Tropical Conditions

Warm, damp climates expose the equipment to damage from moisture and fungus. The high relative humidity causes condensation when the temperature of the equipment drops below that of the surrounding air. Adequate ventilation will minimize this condition. Keep the cover of the test set closed as much as possible. Wipe all moisture and fungus from the exterior of the test set with a clean, lint-free cloth.

30. Operation in Desert Climates

Desert climates expose the test set to damage from dirt, dust, sand, and the effects of strong sunlight. Provide means for keeping dust and sand from entering the holes in the test sockets, adapters, and jacks, and from accumulating around the pushbuttons and other moving parts of the test set. Clean and dust the equipment frequently. When not in use, keep the cover closed to keep dust and dirt out of the exposed parts.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

31. General

The procedures in paragraphs 33 through 39 are to be performed by the operator or organizational maintenance personnel. Operator's maintenance consists of preventive maintenance (par. 33), visual inspection (par. 34), and replacement of electron tubes (par. 37) and lamps (par. 39). Organizational maintenance of the test set is limited to preventive maintenance (par. 33) and to the replacement of the adapters (fig. 8), knobs and pushbuttons, indicator light lens, cable clamps, and clip insulators. The only tools required are those tools normally available to the repairman-user because of his assigned mission.

32. Materials Required

The materials required for operator's and organizational maintenance are as follows:

a. Cleaning compound (Federal stock No. 7930-395-9542).

b. Cleaning cloth.

c. Sandpaper, #0000.

33. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 11 and 12) is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items not applicable to the test set are lined out in figure 12. References in the ITEM block in figure 12 are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the form.

b. Items. The information shown below supplements DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the case, the front panel, and the adapters. If necessary, wet a cloth with cleaning compound and then wipe the parts with a dry, clean cloth.
2	Inspect the clips that hold the adapters and the clips that hold the test leads (TV-7B/U and TV-7D/U) for tight spring action. Check the ring binder for proper operation. Check the PILOT, FUSE, and SHORTS lamps for broken glass. Check to see that the socket-saver adapters (fig. 7) are tightly secured in their respective test sockets.

***Warning*: Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.**

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE
TEST SET, ELECTRON TUBE TV-7D/U

EQUIPMENT SERIAL NUMBER
2404

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPERATOR	2/3 ECHELON	DATE	SIGNATURE
✓		8 FEB '60	Harold Andrews
	✓	22 FEB '60	James Drake

4

DA FORM 1 MAY 57 11-266

U. S. GOVERNMENT PRINTING OFFICE: 1957 O—427138

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF FEBRUARY 1960

NO.	DAILY ITEM	1 HA 17	2 HA 18	3 HA 19	4 HA 20	5 HA 21	6 HA 22	7 HA 23	8 HA 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, ~~CASES, CABINETS, CONTROL PANELS, INTERCONNECTING PLUGS,~~ CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PAR. 31b	✓	✓	✓	✓	✓	✓	✓	✓									✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, ~~CONNECTORS~~ AND PILOT LIGHTS. PAR. 31b	✓	✓	✓	✓	✓	(X)	✓	✓									✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS.	✓	✓	✓	✓	✓	✓	✓	✓									✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓									✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE ~~AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PAR. 9d	✓					✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS. BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE DA LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS~~, FUSES, ~~CONNECTORS, PLUG-IN COILS,~~ LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. ~~INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREWTYPE TERMINALS OF TRANSFORMERS,~~ FIXED CAPACITORS, RESISTORS, ~~CHOKES,~~ POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES;~~ CLEAN INTERIOR OF CHASSIS ~~AND CABINETS.~~	✓
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. METER GLASS BROKEN. REPORTED TO HIGHER ECHELON MAINTENANCE FOR REPLACEMENT.

2 3

Figure 12. DA Form 11-266, pages 2 and 3.

34. Visual Inspection

a. When the equipment fails to perform properly, check the items listed below.

(1) Test leads, if used, poorly connected or improperly connected.
(2) Incorrect pushbutton depressed.
(3) Improper setting of selector switches or controls (par. 18*b*(3)).
(4) Battery or resistors improperly connected (par. 24*a*).
(5) FUSE lamp defective.
(6) LINE ADJUST control improperly adjusted (par. 17*c*).

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (par. 35).

35. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the operator or the organizational maintenance man can perform are given in the *Corrective measures* column. When using the checklist, start at step 1 and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken. Perform the steps in *b* below.

b. Checklist.

	Step	Item	Action or condition	Normal indication	Corrective measures
PREPARATORY	1	Ac line cord.	Connect ac line cord to power source.		
	2	POWER switch.	Set switch to ON position.	PILOT lamp lights.	Check ac line cord connection. Remove (par. 39*a*) and check (par. 23) PILOT lamp; replace if defective. Remove (par. 39*a*) and check (par. 23) FUSE lamp; replace if defective. Higher echelon repair required.
	3	Meter.		Pointer stays at zero.	Defective type 86 tube; replace tube (par. 37) .
	4	Pushbutton 1—LINE ADJ.	Depress pushbutton.	Meter pointer moves up-scale.	Higher echelon repair required.
	5	LINE ADJUST control knob.	Rotate control knob, while holding pushbutton 1—LINE ADJ. down, until meter pointer is directly over LINE TEST mark.	Meter pointer moves when control knob is turned.	Check for low-line voltage if pointer will not adjust properly. Higher echelon repair required.
	6	Selectors.	Set selectors as directed in paragraph 17*e*(1).	Selector knobs should be tight and point directly at a number or letter. The switch detents should be positive.	When a selector pointer is between two numbers or two letters, rotate switch fully counterclockwise. Loosen knob setscrew, turn knob until it points directly at the first number or letter, and tighten setscrew. Tighten loose knobs. If switch detents are not positive, higher echelon repair is required.
	7	FUNCTION SWITCH.	Rotate switch through the five SHORTS positions.	SHORTS lamp glows at positions 2 and 3 of switch.	Check switch settings. Replace SHORTS lamp (par. 39*b*). Higher echelon repair required.
	8	POWER switch.	Set switch to OFF position.	PILOT lamp goes out.	

	Step	Item	Action or condition	Normal indication	Corrective measures
START	9	Selectors and controls.	Set according to test being performed.		
	10	Tube under test.	Insert in proper test socket. Make connections as required.	Tube pins enter test socket without forcing.	Check for bent pins. Straighten pins of miniature tubes in one of the pin straighteners.
	11	POWER switch.	Set switch to ON position.	PILOT lamp lights.	
EQUIPMENT PERFORMANCE	12	Meter.	Checking tube for dynamic mutual conductance, emission, or gas.	Meter pointer indicates condition of tube under test when proper pushbutton is depressed.	If meter pointer stays at zero, tube under test may be defective. Check setting of selectors and controls. Test another tube. Higher echelon repair required.
	13	BIAS control.	Gas test.	Meter pointer can be adjusted to 10 by turning control knob.	Adjust BIAS control knob until pointer indicates 100, then proceed with gas test.
	14	Panel lamp test socket.	Checking a panel (pilot) lamp (par. 23).	A good lamp will light.	Make good contact between lamp and test socket. Check control settings. Lamp may be defective; check other lamps if available. Higher echelon repair required.
	15	Adapter E104 (fig. 8).	Testing long lead subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Unsnap locking device on adapter, move tube up and down to check seating of leads, and secure locking device. Test tube again. Check control settings. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Replace adapter and check tube again. If meter pointer does not move when correct pushbutton is depressed, test another tube. Higher echelon repair required.
	16	Adapter E105 (fig. 8).	Testing tube type 3E29, 829-B, or 832-A.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of adapter and tube. Check plate lead for a good connection. Check setting of controls. Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	17	Adapter E107 (fig. 8).	Testing tube type 2C39.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of tube and adapter. Remove adapter and tube and squeeze spring contacts closer together if necessary. Check setting of controls. Replace adapter and tube in test socket and test tube again.

	Step	Item	Action or condition	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE					Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	18	Socket X109 (fig. 9).	Testing flat subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Check to see that dot on base of tube is aligned with dot on test socket. Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Test another tube. Higher echelon repair required.
	19	Socket X110 (fig. 9).	Testing round subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Test another tube. Higher echelon repair required.
STOP	20	Tube under test.	Remove from test socket.		
	21	POWER switch.	Set to OFF position.	PILOT lamp goes out.	
	22	Ac line cord.	Remove ac line cord plug from power source.		

36. Removal of Chassis

a. Removal.

(1) Unsnap the latches and open the cover of the test set.

(2) Unwind the ac line cord from the retainer bracket and remove the cover from the test set. Remove the cover by sliding it to one side until the hinge pins are disengaged.

(3) Remove the screws that secure the front panel to the case.

(4) Hold the front panel to the case, turn the test set over, and gently place it on a clean, flat surface.

(5) Slowly lift the test set case upward until it is clear of the chassis.

b. Replacement.

(1) Position the test set case so that the handle is forward.

(2) Carefully lower the test set into the case. Be sure that no wires are caught between the front panel and the edge of the case.

(3) Replace the screws that secure the front panel to the case. Tighten the screws in rotation a little at a time to prevent binding.

(4) Replace the cover on the case, wind the ac line cord counterclockwise on the retainer bracket, secure the plug under the clip (not on TV-7/U), close the cover, and secure the latches.

37. Tube Replacement

When trouble occurs, check the ac line cord connection and the control settings before removing any tubes. If tube failure is suspected, use the tube substitution method (*a* below) to check the tubes.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.**

a. Tube Substitution Method. Replace a suspected tube (*b* below) with a new tube. If the equipment still does not work, remove the new tube and put back the original tube. Repeat this procedure with the other tube. If the test set is still inoperative, other checks are required (par. 35*b*).

b. Replacing Tubes in Test Set, Electron Tube TV-7(*)/U. Check the tubes in the test set as follows:

(1) Remove the chassis from the case (par. 36*a*).

(2) Remove the tube clamp (fig. 13) from the threaded stud and remove the tube.

Caution: **Be careful not to hit the meter case with tube type 83 when removing the tube.**

(3) Replace the tube (*a* above) with one of the running spares.

(4) Set the tube (or a replacement) in the socket and secure it with the tube clamp.

(5) Replace the chassis in the case (par. 36*b*).

38. Preferred-Type Tubes

A preferred-type electron tube, type 5Y3WGTA, has been developed as a direct replacement for nonpreferred types 5Y3GT and 5Y3WGT (par. 7). The 5Y3WGTA is used in the power supply. When replacement of a 5Y3GT or a 5Y3WGT is necessary, replace it with a 5Y3WGTA. Do not substitute a 5Y3GT or a 5Y3WGT for a 5Y3WGTA.

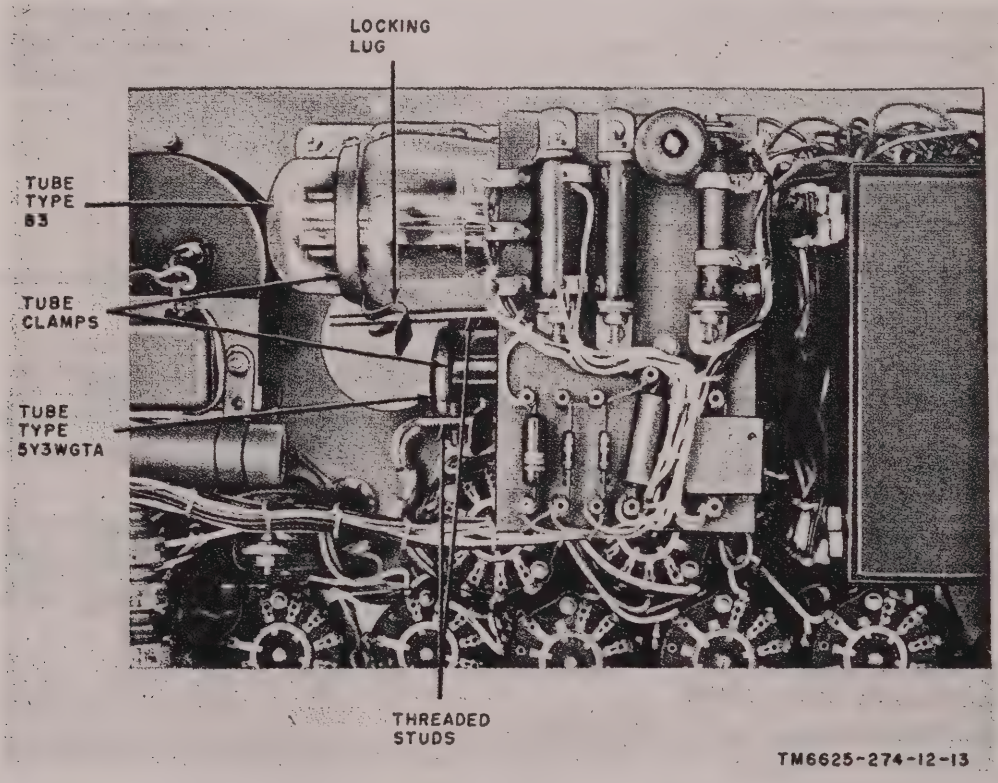

Figure 13. Tube location.

39. Replacement of Lamps

The FUSE, PILOT, and SHORTS lamps are removable from the front panel of the test set.

a. The FUSE lamp and PILOT lamp have bayonet-type bases. Unscrew and remove the PILOT lamp indicator jewel to gain access to the PILOT lamp. To remove either lamp, press downward, turn the lamp to the left, and lift straight up. To replace the FUSE or PILOT

lamp, insert the lamp in the appropriate socket, press downward, turn the lamp to the right, and release it. Replace the PILOT lamp indicator jewel.

b. The SHORTS lamp has a screw-type base. Remove the lamp by turning it to the left; replace the lamp by turning it to the right.

CHAPTER 4
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

40. Removal From Service

a. Set the POWER switch to the OFF position and disconnect the test set from the power source.

b. Place the adapters under the clamps on the cover.

c. Wind the ac line cord counterclockwise around the retainer bracket and place the plug under the clip (not on TV-7/U). Place the test leads under the coiled ac line cord (TV-7/U and TV-7A/U) or as shown in figures 1 and 2. On the TV-7B/U and the TV-7D/U, insert one end of the test leads into the storage clips and connect the alligator clips to the studs (fig. 3 and 4).

d. Close the cover and secure it with the latches.

41. Repackaging for Shipment or Limited Storage

(fig. 14)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 8) will also be helpful.

a. Material Requirements. The following materials are required for repackaging Test Set, Electron Tube TV-7(*)/U. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Flexible corrugated fiberboard	10 sq ft
Waterproof wrapping paper	10 sq ft
Gummed paper tape	3 ft
Pressure-sensitive tape	4 ft
Metal strapping (⅝- by 0.020-inch) (*Note.* Strapping seals required)	8 ft
Wooden box (inside dimensions: 18⅜ by 10¼-by 7⅞-inch)	1 ea (9 bd ft)

b. Packaging.

(1) *Technical manual.* Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the seams with pressure-sensitive tape.

(2) *Spare parts.* Wrap each part within a layer of flexible corrugated fiberboard. Seal the seams with gummed paper tape. Overwrap the flexible corrugated fiberboard with waterproof wrapping paper and seal with pressure-sensitive tape.

(3) *Test set.* The procedure used to package the test set is the same as the procedure used to package the spare parts ((2) above).

c. Packing.

(1) Fabricate a wooden box.

(2) Place the packaged test set (*b*(3) above) in the wooden box.

(3) Place the spare parts (*b*(2) above) and the technical manuals on top of the test set.

(4) Nail down the wooden cover.

(5) Strap the wooden box when intertheater shipment is involved.

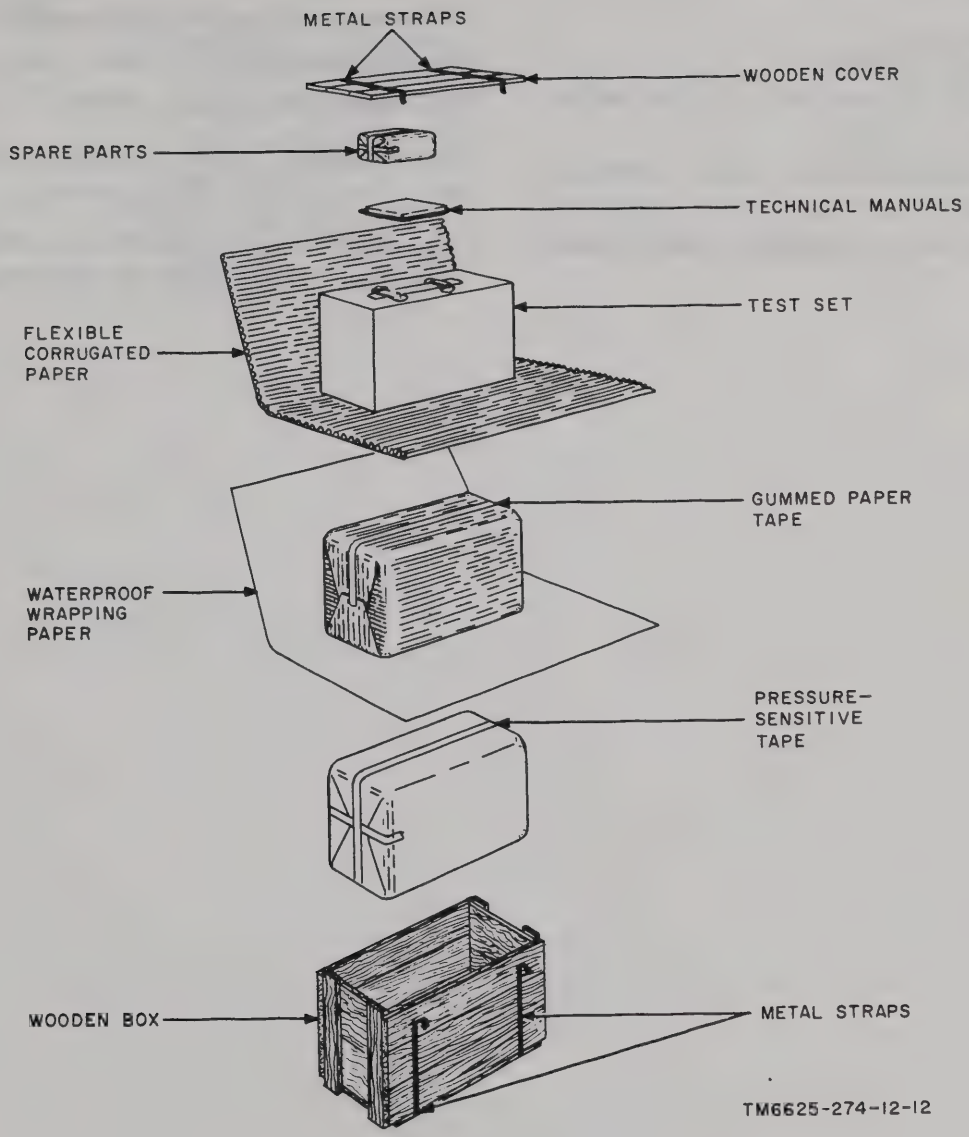

Figure 14. Field repackaging diagram.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

42. Authority for Demolition

The destruction procedures outlined in paragraph 43 will be used to prevent further use of the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

43. Methods of Destruction

Any or all of the methods of destruction given below may be used.

a. Smash. Use sledges, axes, hammers, crowbars, or any other heavy tools available; smash the case, cover, adapters, front panel, and meter.

b. Cut. Use axes, handaxes, machetes, or knives; cut the ac line cord and test leads.

c. Burn. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades; burn the technical manuals and test data book.

Warning: **Be extremely careful with explosive and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use grenades, TNT, or firearms, if explosives are necessary.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways.

APPENDIX I
REFERENCES

Following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U:

SB 38-100	Preservation, Packaging and Packing Materials, Supplies and Equipment Used by the Army
TB 11-5083-1	Tube Test Data for Electron Tube Test Sets TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U

APPENDIX II
OPERATOR'S MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope

a. General. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part* of the major item, and all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns. The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* A dagger (†) indicates the model in which the part is used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustrations (Figure No.).* The numbers in this column refer to the illustration or illustrations where the part is shown.

(9) *Illustrations (Item No.).* This column lists the reference symbols used for identification of items in the illustrations or text of the manual.

2. Critical Items

A zero slash (0) in the "Description" column indicates items that are expected to fail during the first year; also items that will make the equipment inoperative if they fail.

Section II. FIRST ECHELON FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL				(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS	
										FIGURE NO.	ITEM NO.
		1	2	3	4	ITEMS COMPRISING AN OPERABLE EQUIPMENT					
						TEST SET, ELECTRON TUBE TV-7/U; TV-7/A,B,D/U					
						NOTE: Model Column 1 refers to TV-7/U; Column 2 refers to TV-7A/U; Column 3 refers to TV-7B/U; Column 4 refers to TV-7D/U					
	6625-376-4939					TEST SET, ELECTRON TV-7/U; TV-7A,B,D/U:	ea	NX		1,2,3,4	
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM 11-6625-274-12P:	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL BULLETIN TB-11-5033-1	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM11-5083	ea	X	2		
	5935-204-8379	†	†	†	†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-B-179212	ea	X	1	8	E104
	5935-201-8500	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-33	ea	X	1	8	E105
	5935-537-4056		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-C-179260	ea	X	1	8	E105
	5935-502-1777	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-50	ea	X	1	8	E107
	5935-511-6491		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-B-179230	ea	X	1	8	E107
	6625-684-1189	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X3B	ea	X	1	4	X3B
	6625-618-9928	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X7B	ea	X	1	4	X7B
	6625-618-9929	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X10B	ea	X	1	4	X10B
	6625-586-8349			†		COVER, TEST SET: Hickok part No. 3145-333	ea	X	1	3	
	6625-668-4683	†	†	†	†	LEAD, TEST: Hickok part No. 12450-245	ea	X	2	1,2,3,4	W101 W102
						RUNNING SPARES AND ACCESSORY ITEMS					
						TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U					
	5960-262-0218	†	†	†	†	Ø ELECTRON TUBE: MIL type 5Y3WGTA	ea	X	1	15	V102
	5960-100-7323	†	†	†	†	Ø ELECTRON TUBE: MIL type 83	ea	X	1	15	V101
	6240-179-1814	†	†	†	†	Ø LAMP, GLOW: GE part No. NE-45	ea	X	1	15	E101
	6240-014-2306	†	†	†	†	Ø LAMP, INCANDESCENT: GE part No. 81	ea	X	1	15	E103
	6240-155-8706	†	†	†	†	Ø LAMP, INCANDESCENT: GE part No. 47	ea	X	1	15	E102

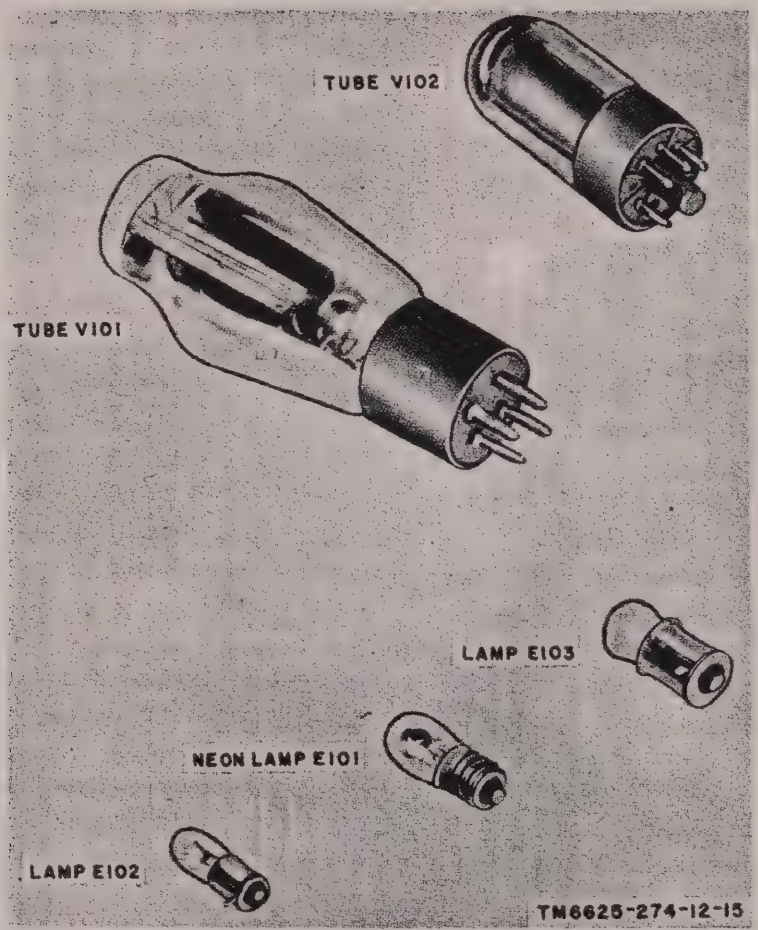

Figure 15. Electron tubes and lamps.

APPENDIX III
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. Scope

a. General. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Allocation of Maintenance Functions. Columns in section II, Allocation of Maintenance Functions, are defined as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(h) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation. Column 5 is not used.

(4) *Tools required.* This column indicates the tool, test, and maintenance equipments required to perform the maintenance functions. These numbers are identified in section III, Allocation of Tools for Maintenance Functions.

(5) *Remarks.* This column contains any notations necessary to clarify the data cited in the preceding columns.

c. Allocation of Tools for Maintenance Functions. Columns in section III, Allocation of Tools for Maintenance Functions, are as follows:

(1) *Tools required for maintenance functions.* This column lists the tools and test equipment required to perform the maintenance functions.

(2) *1st, 2nd, 3rd, 4th, and 5th echelon.* A dagger (†) in columns 3, 5, and 6 indicates that the tool or test equipment is allocated to that echelon. Columns 2 and 4 are not used.

(3) *Tool code.* This column lists the tool code assigned. The numbers are used

in the maintenance allocation chart to refer to the indicated item.

(4) *Remarks.* Not used.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, and clamps.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	
ADAPTER, TUBE SOCKET	replace		X					
	repair				X			
BINDER, LOOSE LEAF	replace				X			
BUTTON, PUSH	replace				X		5	
BUMPER, RUBBER	replace				X			
INSULATOR, CLIP	replace		X					
CABLE, POWER, ELECTRICAL	replace				X			
CAPACITOR	replace				X		5	
CASE (2) ELECTRICAL EQUIP CABINET	replace					X	5	
	repair					X	5	
CATCH, LUGGAGE	replace				X		5	
HANDLE, LUGGAGE	replace				X		5	
CLAMP, ELECTRICAL	replace		X					
CONNECTOR	replace				X		5	
DIAL CONTROL	replace				X			
	repair				X			
ELECTRON TUBE	replace	X						

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TV-7/U; TV-7A,B,D/U (continued)								
GASKET, RUBBER	replace				X		5	
	rebuild					X	5	
GROMMET, RUBBER	replace				X		5	
HINGE, BUTT	replace				X		5	
KNOB	replace		X					
LAMP, GLOW	replace	X						
LAMP, INCANDESCENT	replace	X						
LAMPHOLDER	replace				X		5	
LIGHT INDICATOR	replace				X		5	
LENS, INDICATOR LIGHT	replace		X					
LEAD, TEST	replace				X			
	rebuild				X		5	
CLIP, ELECTRICAL	replace				X		5	
JACK, TIP	replace				X		5	
METER, ELECTRON TUBE TESTER	replace				X		5	
	repair					X	5	
RECTIFIER, METALLIC	replace				X		5	
RESISTOR	replace				X		5	
RETAINER, ELECTRON TUBE	replace				X		5	
SOCKET, ELECTRON TUBE	replace				X		5	
STRAIGHTENER, PIN	replace					X		
STUD, THREADED	replace				X			
SWITCH	replace				X		5	
TERMINAL, STUD	replace				X		5	
TRANSFORMER, POWER	replace				X		5	

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
TV-7/U; TV-7A, B, D/U							
MULTIMETER TS-352/U				†	†	1	
RESISTOR, DECADE ZM-16/U				†	†	2	
TEST SET, ELECTRON TUBE TV-7/U				†		3	
TEST SET, ELECTRON TUBE TV-2/U					†	4	
TOOL EQUIPMENT TE-113				†	†	5	
TRANSFORMER, VARIABLE CN-16/U				†	†	6	
VOLTMETER, METER ME-30/U				†	†	7	
TOOL AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				8	

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For explanation of abbreviations used, see AR 320–50.

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